

# MOTHER NATURE'S CHILDREN

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A STUDY OF

THE RELIGIOUS ASPECT OF NATURE

FOR

YOUNGER READERS

BY

ALLEN WALTON GOULD

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*"The happiest man is he who learns from Nature the lesson of worship."*—Emerson.

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## PREFACE.

These leaflets are intended to teach religion through nature. The Bible stories of creation and of the miracles wrought for a chosen people or for an only-begotten son, taught God's love and care to the children of the past; and in the same way these stories of nature are to teach to the children of the present the divine love and care found in all living things. If the child can be made to feel the immanence of God in all things, in animal and insect and plant as well as in man, that feeling ought to be the surest foundation for a religion that will abide.

The scientific parts are put in an imaginative frame-work of Mother Nature's Children because the child-mind can grasp its facts only as fairy tales, but the utmost care has been taken to tell nothing but established facts, and to use illustrations drawn from trustworthy sources only. In this imaginative frame-work those actions of animals and those processes of nature have been set, which indicate a purpose intelligible to the child, like "Cradling the Baby," "Clothing the Family," "Setting the Table," "Learning to Walk," and so on. This differs from the usual methods of scientific books, which teach about the shape and color and classification of animals or plants, and touch on their life-habits or mutual helpfulness only incidentally or not at all. In these leaflets, however, the life-habits and mutual helpfulness are the main topic, and the other facts are used only to set that forth. This difference is something like that between learning the letters of the alphabet or the words of the dictionary, and learning to read a story or a poem. The facts of science, as taught in the books of Biology, are the letters or the words; while the

Wisdom and Care, the Love and Foresight in all creation and for all creation, are the stories and poems, which the facts of Nature spell out, when the alphabet and dictionary are mastered enough to begin to read the great Book.

The lessons were published in the form of separate leaflets, fully illustrated, to be put into the hands of each child, so that the illustrations should appeal to the eye of the child. Sight is a far earlier acquisition than hearing, and consequently a far more potent means of conveying instruction to immature minds.


Things seen are mightier than things heard.

And by asking the children to tell what they see in the pictures, before describing them, the attention is aroused and the mind awakened more than by any description. The same is true of the work of art in each number. The child must tell the story of it first, if they would get the most education out of it. And the beauty of the picture will form a real part of the religious development of the little soul. And by giving one number to each child each week, to carry home to to the parents and to keep for his or her own, the home-circle is brought into the religious life of the child.

The leaflets are longer than is necessary for most classes, but the lesson itself is usually taught in two or three of the pictures and only repeated in the others, so that hardly any of the numbers need to be taken entire in order to get the lesson. It will generally be better to take the two or three best pictures and spend the whole hour on them, and then let the children take the papers home and find out about the other pictures from their parents.

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*The happiest man is he who learns from Nature the lesson of worship*—EMERSON.

## Mother Nature's Children.

*O Nature, gracious mother of us all.*—LONGFELLOW.

### I.

#### CRADLING THE BABY.



#### THE BABY'S CRADLE.

This beautiful picture was painted by Sir Edwin Landseer, who has made so many pictures of animals. He especially likes to put dogs in his pictures. In this picture we see a dog—the Scotch Collie—rubbing his head against the cradle, as if he loved the baby that lies in it. And there are some other babies on the floor, three little baby chickens, with their mother. And I dare say that the sheep lying on the floor was a baby lamb whose mother died in the cold spring. For when the mother of a little lamb dies, the shepherd takes it up in his arms and carries it into the house, and feeds it with warm milk by the fireside; and so it grows up in the house and loves to play with the baby.

And where do you suppose that baby got her cradle, that little rocking couch, with a soft bed in it to lie on and a canopy at the head to keep the wind and light from the sleeping child? Of

course the baby did not make her own cradle. Some one else made it for her. Perhaps her father got some boards, and with saw and hammer and nails constructed the little bed; or perhaps he went to the carpenter's or cabinet-maker's and hired one of them to make it for him. And he did it because he loved his little child so much. The mother's face, too, looks as if she loved the baby well enough to get a cradle for her, if the father had not provided one. For it is because we love our babies that we make cradles for them.

But birds and animals and insects also make cradles for their young, as we shall see; and even the plants cradle their babies in beautiful flowers. And they appear to do it because they love their little ones, as your parents love you. So that it seems as if the same great Love in us all—in man and bird and insect and plant—had impelled us all to make cradles for our children.



Together weave from love a nest  
For all that's good and sweet and blest  
To brood in.—*Gannett.*

### THE HUMMING-BIRD'S CRADLE.

Here is the cradle of the humming-bird. You see it is no bigger than half an egg-shell, and the one in the picture has two eggs in it about the



size of peas. It was made by those two beautiful birds that sit on the rose-bush beside it. Mr. Humming-Bird and his little wife live in Mexico and build their nests in the gardens there. And how do you suppose they manage to make such a dainty little cradle for their tiny babies?

If you and I could steal softly to their rose-bush when they were at work, we should see first one bird and then the other come with a mouthful of spider's webs mixed with the downy fibres that grow on seeds, like the soft white threads that float the dandyion seeds. Each bird would put the down on the bush where the nest was to be, and would tie it fast to the branch by winding the spider's web about it.

Then the mother-bird would sit down on the pile of fibres, and by turning round and round on it, she would press it and round it into the circular bottom of a little nest. Then the husband would bring her more downy fibres and spider's webs as fast as he could find them, and she would work them into the side of the nest in the same way. But the white down of the nest could be seen a long way off, so that you could find the nest easily, if the down were left uncovered. So the wise

little birds gather bits of grey lichen or thin moss, such as you find on tree-trunks or rocks, and put them all over the outside of the nest and make it look just the same color as the bush on which it rests, to hide it from us.

In a week they finish their work, and then in a day or two you would find two little eggs, and a couple weeks later you would discover two of the tiniest little birdies you ever saw.

### BABIES IN A BAG.

A bag is rather an odd place for babies to be in, isn't it? But it has one great advantage. The babies cannot fall out of it. I suppose that is what Mr. and Mrs. Oriole thought when they decided to make such a nest as the one in the picture, for it is exactly like a bag with the three corners fastened to the branches of the tree. Their dear little babies will be safe enough in it. But how could birds weave such a nest as this?

Perhaps you have seen the oriole picking up strings and long grasses about the orchards or lawns in the spring and flying away with them. He takes one of the longest and strongest and winds one end of it around a branch of the tree he has chosen for his nursery. Then he winds the other end of the strand about another branch close by, leaving a loop hanging down as long as he wishes the nest to be.

Then his mate brings another strand and makes a loop with it, just as Mr. Oriole did with his, so that two loops are now hanging down. They do this again and again, till they think they have loops enough for their bag. Then they begin to weave in between the strands finer material, like down or tow. Usually one of the birds stays inside weaving and picking and pressing the down and tow into shape, while the other brings it from the fields or forest.

As you may imagine, they are very glad to get anything that they can use in making this cradle. One nest was made almost entirely of tow, furnished by a man who loved birds, and the oriole was so delighted to have such a gift, that he would burst into song with his mouth full of tow. He could not wait to express his thanks till he came back for more. But they do not always wait for people to give them the strings they want. One eager pair were making their nest not far from a house where a woman sat sewing by an open window. She left the room for a moment and when she came back she could not find the measuring-tape or the skein of silk she had been using. The birds had flown into the window and





ORIOLE'S NEST.

carried them off and woven them into their nest.

I will tell you the story of something that befell a Mrs. Oriole who did this. She and her husband were a very happy pair. They had first met each other in an orchard in the beautiful month of May. Two or three gaily colored songsters of the Oriole family had been trying to win this young lady bird as their wife. Each one of them had sung his sweetest to her, and looked his finest and behaved his best, in order to persuade her to choose him. But when she saw Mr. Oriole, and heard him sing to her, she fell in love with him at once. And when she had chosen him, you should have seen how fond he was of her—singing to her, bringing her the daintiest bits of food he could find, talking to her in the sweetest little ripple of cooings, and paying her every possible attention.

After a day or two they went house-hunting for a tree to hang their cradle in. They went from one tree to another for several days, till at last she discovered a graceful elm where there were two drooping branches close together and high up out of the reach of cats and bad boys. Then they set to work at once weaving their little cradle. Early in the morning, before you and I were awake, they were flying over the fields and through the forests to find the bits of fibre they needed.

They had been working for four days early and late, and in a day or two more they would have finished the nest, when Mrs. Oriole happened to

spy a skein of thread hanging by an open window. She thought that this would be just what she wanted and would save her many a long search and perhaps enable her to finish the nest a day sooner. So she darted into the window, caught the thread in her mouth, and flew quickly to the unfinished nest. There she found her husband hard at work weaving in a horsehair he had found in a pasture. He was delighted with the thread, and they both set to work to weave it in and out through the sides of the nest.

But it was so long that it got into a snarl, and as they were trying to untangle it, Mrs. Oriole somehow got both her tiny feet caught in one of the knots. She was dreadfully frightened and tried to fly, but the harder she tried the harder the knot pulled around her ankles, till she could only hang fluttering and wailing just below the nest. Her husband tried to help her, and picked at the knot, but he could not untie it. He could only moan with her. So in a few hours the poor little lady was dead. She had lost her life working for the little babies she loved, even before they were born.

### BABIES IN BOTTLES.

A baby in a bag is in a pretty safe place, but a baby in a bottle is still safer; and the ingenious little birds that made this nest have covered it all



THE TITMOUSE'S NEST.



AFRICAN WEAVER-BIRD'S NEST.

over at the top and made a round passage-way at the side, like the neck of a bottle or flask, tipped to one side. These bright little cradle-makers are foreign relations of our own Chickadees. They live in Europe, and are called Titmice, because they are so small. But small as they are, they have succeeded in making a nest that keeps the sun and wind and rain from the babies they love so well.

But the Weaver birds of Africa, have succeeded still better. They have hung their nests upside down, with the entrance at the very bottom, like a decanter wrong side up. They have a safe little cot for their babies at the large part of the nest, with a high side to keep them

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Get the help of some local student of science, if possible. Read some chapters of "In Nesting Time," or "Bird Ways," or "Little Brothers of the Air," by O. T. Miller; or of "Wake Robin," or "Signs and Seasons," by John Burroughs, or any of his other publications, or those of C. C. Abbott. "Homes without Hands," by J. G. Wood, is a good book for the whole subject, but the works of Audubon, Nuttall and Wilson are still unsurpassed for American bird-life. W. H. Gibson has an article on "Bird Cradles" in *Scribners*, Vol. 8, and T. M. Brewer on "Architecture of Birds" in *Scribners*, Vol. 16 and 17. Procure a common bird's nest to study and take into the class room.

*In the Class Room:* Have the children tell you how the nests are made. Ask why birds build in trees rather than on the ground; why on the tips of branches rather than close to the trunk; why with openings below the nest, in the land of monkeys; why they have their nests over water; why the birds that have strong feet for walking or swimming do not build finely woven nests; why the birds that have strong beaks for fighting do not make fine nests; and other questions, to make the children see the wisdom as well as the love of birds. Ask them to find out from their parents, or others, all they can about the nests of common birds by the next Sunday, and bring a nest if they can discover an empty one. Half of the hour the next Sunday can well be spent on this same lesson.

*Outline of the Course for the Year:* It will be seen by the outline given below that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby"

from falling out. When they build their hanging nests, one of the birds stays inside and the other outside, and the outside bird pushes a strip of grass through the strands, and the bird within pushes it back in another place; and so they weave the strip out and in till their baby's cradle is finished. They only stop now and then for a frolic, chasing each other merrily through the trees with many a gentle twitter and loving caress.

They like play as much as you do. But these loving pairs never quarrel. Each seems to think that the other is just right. The nearest approach to a quarrel that I have heard of in birdland was where one bird refused to bring any more stuff to weave into the nest till his little mate had taken a romp with him. He even picked at the nest roguishly, as if he would tear it down. His mate came out of the nest and gave him a little love-pat with her bill and then darted off through the trees for just a minute's sport with him. At the end of the minute they were back at work as hard as ever, making a cradle for their dear little babies.

*And one of them shall not fall on the ground without your father.*

He prayeth well who loveth well  
Both man and bird and beast;  
He prayeth best who loveth best  
All things both great and small,  
For the dear God who loveth us,  
He made and loveth all.—Coleridge.

runs through the first four lessons, "Tending the Baby" through the second four, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

#### MOTHER NATURE'S CHILDREN.

I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.

II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Insects; 8. Fish.

III. *Getting Food.* 9. Sea Anemones; 10. Plants; 11. Worms; 12. Bees and other Insects.

IV. *Getting New Clothes.* 13. Men; 14. Caterpillars and Crawfish; 15. Nautilus; 16. Tortoise.

V. *Learning to Walk.* 17. Men and Quadrupeds; 18. Insects; 19. Centipedes; 20. Snakes and Worms.

VI. *Getting Wings.* 21. Bats and Squirrels; 22. Birds; 23. Butterflies; 24. Seeds.

VII. *Helping each other.* 25. Men; 26. Beavers; 27. Termites; 28. Flowers.

VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.

IX. *Borrowing and Lending.* 33. Men from Animals and Plants; 34. Animals and Insects from Plants; 35. Plants from Earth; 36. Earth from Sun.

X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.



*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

*O Nature, gracious mother of us all.*—LONGFELLOW.

### I.

#### CRADLING THE BABY.

##### FABLE.

The Mountain and the Squirrel  
Had a quarrel,  
And the former called the latter  
"Little Prig;"  
Bun replied,  
"You are doubtless very big;  
But all sorts of things and weather  
Must be taken in together,  
To make up a year  
And a sphere.  
And I think it no disgrace  
To occupy my place.  
If I'm not so large as you,  
You are not so small as I,  
And not half so spry.  
I'll not deny you make  
A very pretty squirrel track.  
Talents differ; all is well  
and wisely put;  
If I cannot carry forests  
on my back,  
Neither can you crack a nut."

—Emerson.

##### THE SQUIRREL'S CRADLE.

Here is a happy little family, and they have a cradle large enough for them all to snuggle into at night, if they pack themselves very close together. And how do you suppose they managed to make this tiny cradle? I do not think you ever saw them building a nest, because they are so very shy and put their cradle so deep in the forest and so high on the tree. But an Englishman who wore clothes the color of the forest and lay perfectly still on the ground, so that they could neither see him nor hear him, tells us how they did it.

In the first place, Mr. Squirrel had to get himself a wife; and that was no easy task. There were a dozen other young squirrels who wanted to marry this same Mrs. Squirrel, and so he had to show himself stronger and braver than all the rest of them before he could persuade her that he was the best. And even then she led him a merry dance through the trees. She ran to the very top of the



tallest tree, keeping on the other side of the trunk from him and peeping mischievously around it now and then at him with her bright eyes.

And when he thought he had caught her at the top she dodged him and scampered gaily down to the lowest branch. When she reached that, she jumped lightly to the ground and was up another tree and out of sight in a second. He raced after her but could not see her or hear her anywhere. Then he stopped and peered into the branches and tipped his pretty little head over on one side as if he were listening with all his might. In a minute or two he heard the faintest little foot fall and away he was after her again.

So they played hide and seek through the forest



till she let him catch up with her at last, and then they came scampering back again, leaping lightly from one tree to another. After a while they began to think of a cradle for the little ones, though they kept up their merry sport whenever they were not at work building the nest.

The first thing they did was to find some large bird's nest of last year to use as a foundation for their cradle. Then they went down to the ground and gathered ever so many mouthfuls of dead grass or flower stalks, nibbling them off close to the lower end. When they had brought up enough they put on an arched top and wove in the twigs and grass and stalks so close together that neither wind nor rain could get in to wet the little babies when they come. Inside they put soft moss; and then Mother Squirrel pulled out a lot of hair from her breast to make the softest possible couch for her dear little babies.

And when the babies come she cares for them tenderly, and she will not desert them either if any danger threatens them. She and her husband have two or three nests besides this softly lined cradle. And if any bad boy climbs to this one the papa and mama take their little ones in their mouths and carry them off to another nest. But once when the mother could not carry off her babies, she staid in the nest, even when the tree was cut down and came crashing to the ground, and she refused to leave her little ones even when they were put in a cage.

Another time when Mr. Audubon here in America took a nest of baby flying-squirrels home, their mother went with them, and he put them all in a table drawer, leaving it open a little crack. The next morning the mother was gone but the babies were there. He tried to feed them but they would not take anything, yet they seemed to be growing larger every day. After several days he decided that they must be getting food somewhere, and so he determined to watch them by night as well as by day. He hid himself in the room, and as soon as it began to grow dark the mother squirrel suddenly peeped into the window, and finding no one in sight, she ran softly over to her babies and nestled down to nurse them.

I suppose she felt something as your own mother would feel if she had to go into a lion's den. But if her baby was in the lion's den and crying to be fed, your mother would go, at the risk of her life. And the little squirrel mother risked her life, too, because she loved her children more than her life.

## BABIES IN A BALL.

We have had babies in a bag and in a bottle, and now we have them in a ball. And these are about the tiniest babies there are among animals. You see the papa and the mama in the picture. The mama has found something to eat—a fly, perhaps—and she is sitting up on the top of the nest and holding the bit of food in her hands while she nibbles it. Her husband is climbing up



NEST OF THE HARVEST MOUSE.

the stalk of wheat and holding himself fast by coiling his tail about the stem. They are the tiny harvest mice of Europe and are only two inches long, and so light that it would take a hundred of them to weigh a pound.

But small and light as they are, they make a prettier nest for their little ones than any other animal. They find a place where ten or fifteen stalks of grain are standing close together, and then they take the grass-like blades that grow on the grain and draw them through their mouths with their teeth shut, and so divide them into a lot of fine fibers. But they do not break them from the stalks of wheat; they pull them together so that the stems of wheat make the supports for the cradle. Then they weave the strands of grass in and out, as you see in the picture, forming a perfect ball somewhat smaller than a tennis ball.

When it is finished the wheat goes on growing and the fibers stay green for a long while, so that the nest looks just like the rest of the grain and cannot easily be discovered. The inside of the nest is soft and smooth, because the little par-

ents line it with the down of thistles and dandelions to make it comfortable for the six or eight little babies that the small mama will soon be caring for. Those babies fill the nest so full that Mrs. Mouse can hardly squeeze in to feed them. Whenever she leaves them for a few moments she pulls the strands of grass together over the entrance, so that you and I would not be able to find any opening at all.

But the baby mice do not stay in their ball very long. When they are two or three weeks old the papa and mama help them down the stalks to the ground and begin to teach them how to make a living—for a mouse has to make a living, you know, as well as a man. They soon learn to climb and jump and swim and to find the little insects and seeds they eat, and then they are able to start in life for themselves.

But if anyone attempts to catch them while they are still in the cradle, the little mother will try to run away with them all in her arms at once, using her tail to hold them to her. You can readily imagine that she cannot run very fast with such a load as that. But she loves them so much that she will allow herself to be caught rather than desert them.

But little Mrs. Harvest Mouse is not the only mother who weaves a ball for her babies' cradle. Mrs. Spider makes a little bed of soft, fluffy silk



CROWNED SPIDER'S COCOON.

for her eggs, and then weaves a silk ball around the bed. The ball is soft and yielding inside, but hard and smooth outside. You see such a little ball full of spider babies in the picture. The mother has fastened her cradle to a leaf by spinning threads all about it, and she has tied the edges of the leaf together to make the nest still safer. Then she sits beside it on a leaf to watch over it till the eggs are hatched and the babies ready to come out. If you break off the leaf and throw it to the ground she will immediately raise it to some bush again by spinning threads from the bush to it and then drawing it up. If you tear a hole in it, she will repair it with new silk, so as to keep her babies safe.

In the other picture the mother spider is so

careful of her ball of babies that she even carries it around in her arms and will not let go of it for a moment. If you are cruel enough to pull it away from her by force, she is wild with anxiety



HUNTING SPIDER'S COCOON.

till she finds it again, when she hugs it tighter than ever, just as your mother would if she should lose you and find you once more.

A Frenchman who was studying spiders, once threw a mother and her ball of babies into the pit of an ant-lion—a horrible creature who is fond of eating spider babies, and spider mothers, too, whenever he can get them. She tried hard to pull her little ones from the jaws of the monster, but all in vain. Then the man who was watching her, thought he would save her life, and so drew her out of the pit, leaving her half-devoured nest behind. But the moment he let go his hold of her she rushed back again and seized her nest, right in the jaws of the ant-lion. She loved her babies even more than her life.

### CRADLED IN THE WATER.

Even the fish down deep in the water love their little ones well enough to make cradles for them. They have no hands or feet—nothing but their mouths to work with—yet they manage to weave a comfortable little nest.

In the picture you see two sticklebacks beside a nest that has just been filled with eggs, after the papa had built it; for it is the papa stickleback who does all of the cradle-making. If you could get close to the bank of a brook without his noticing you, you would see him rushing about in search of material for his nest. He gets a bit of weed in one place and a tiny stick in another and tugs them along in his mouth to the place he has chosen. There he puts them down, one after another, laying them close together.

If a stick will not fit one way, he pulls it out and puts it in in another way; or if it is too crooked or too light, he carries it off to a distance and drops it, and gets another, straighter or heavier, in its place. He tries the weight of the





NEST OF THE STICKLEBACK.

sticks by letting them drop. If they fall through the water rapidly, he uses them; if not, he leaves them. When he has got material enough for the

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Get the help of some local student of science, if possible. "Marvels of Animal Life," by C. F. Holder has a full account of the nests of fish, and Chambers' Journal for 1850 describes the "Ways of the Squirrel." "Homes Without Hands," by J. G. Wood, is good book for whole subject. For those reading German, Brehm's "Thierleben," Vol. 2, will give the best account of the mouse and the squirrel.

*In the Class Room:* Have the children tell you how the nests are made. Ask why it is the smallest animals and fish that make the most careful cradles; why the squirrel and harvest mouse, rather than the lion or bear or shark; keep the purpose of the nests steadily in view. Have the children explain the meaning of the poetry and the verses at the end. Encourage them to learn the shorter passages

*Outline of the Course for the Year:* It will be seen by the outline given below that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be

floor of his nest, he glues the pieces together by rubbing his body over them, for you know how sticky a fish's body makes anything he touches.

Then he scoops up a mouthful or two of sand from the bottom of the brook and scatters it over the floor of the nest to make it heavier and more stable. After that he builds up the sides of the nest, rubbing round and round it with his body to stick it fast, and spinning a sort of gluey thread to bind it together, something as a spider spins its web. The roof he makes in the same way, only he has to go through the nest often to keep it the right shape and to smooth it inside. It is pretty hard work for the little fellow—for he is only about as large as a baby's little finger—and he gets so excited with his work that he never stops to rest or to eat.

When he has finished it to his satisfaction, he goes off to find Mrs. Stickleback and coax her to fill his nest with eggs. Then he stands guard over it for many weeks, caring for the eggs, and later for the baby fish. And though he is so small, he will rush upon any fish, no matter how large, that venture to come near his precious charge. He will strike at their eyes, bite their fins, and stick his sharp spine into them, till they are glad to swim off and let his babies alone.

*God is love.*

God made all the creatures, and gave them our love and our fear,

To give sign we and they are his children, one family here.

—Browning.

susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

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IX. *Borrowing and Lending.* 33. Men from Animals and Plants; 34. Animals and Insects from Plants; 35. Plants from Earth; 36. Earth from Sun.

X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.



*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

*O Nature, gracious mother of us all.*—PRESTON.

### I.

#### CRADLING THE BABY.

##### PERSEVERANCE.

A swallow in the spring  
 Came to our barn, and underneath the eaves  
 Began to make a nest, and there did bring  
 Wet earth and straw and leaves.

Day after day she toiled  
 With patient art, but ere her work was crowned  
 Some sad mishap the tiny fabric spoiled,  
 And dashed it to the ground.

She found the ruin wrought,  
 But not cast down, forth from the place she flew,  
 And with her mate fresh earth and grasses brought  
 And built the nest anew.

But scarcely had she placed  
 The last soft feather on its ample floor,  
 When wicked hand, or chance, again laid waste  
 And wrought the ruin o'er.

But still her heart she kept,  
 And toiled again—and last night, hearing calls,  
 I looked, and lo! three little swallows slept  
 Within the earth made walls.

What truth is here, Oh, man!  
 Has hope been smitten in its early dawn?  
 Have clouds o'ercast thy purpose, trust or plan?  
 Have faith, and struggle on!

—ANDROS.

##### CRADLED IN CLAY.

This picture is by a French artist and represents a family of swallows in France. But our swallows here in America build just the same sort of a nest that you see here, and sing the same sweet little twittering song. The only difference of any consequence between the French swallows and those in America is that our Mr. Swallow sits on the eggs sometimes and lets Mrs. Swallow have an hour or two off, while his French cousin lets Madame Swallow do all of the sitting herself, though he is very faithful in supplying her with food as long as she is confined to the nest.

And how do they build this nest? They are very sociable little birds and like to have their nests close to their neighbors' nests, and so where you find one nest you will generally find a lot more near by. And they are fond of human



society as well as of bird society, and so they have left the woods and the fields and chosen sheds and barns for their nesting places. Away up north in British America some men built a rough shed for a temporary blacksmith shop far away from any other buildings. And almost before it was finished two swallows came flying into it as if they were delighted to find civilized beings like themselves. And they went to work at once building their nest right over the anvil within a few feet of the heads of the workmen.

In the town where I lived in my boyhood there was one barn that used to be lined under the eaves with dozens of swallows' nests, while there

were a hundred other barns all around without a single swallow's nest. The birds had all built in this one place to be together. And I used to watch them as they swept gaily back and forth building their nests on beautiful spring mornings. But I know now that they were at work long before I was up. It takes a great deal of labor to make such a large nest when a swallow's bill is all they have to work with.

In the first place the birds have to choose the right place for the nest. It must be sheltered so that the rain will not wash it down, and it must be shaded so that their little ones will not be too warm. Birds often start a nest in the wrong place and then give it up and try in another place. But when they find the right spot they must be careful to get the right sort of clay to make the cradle with, or it will come tumbling down to the ground, as it did in the poem. I suspect that that nest was made by a young couple who had never set up housekeeping before; for the young birds are not able to build as good nests as the older birds.

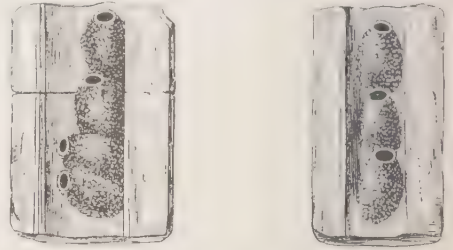
Then they must mix the clay with a little sand and work it over till it is moist and soft. When they have got a little ball of it just right they bring it in their mouth and pack it down on the spot where the bottom of the nest is to be. They start five or six inches below the top of the nest and put on a small layer of little balls against the boards of the barn and then another larger layer above it, with some fine grass or hairs placed in between to make the clay stick better.

You can see in the picture the successive layers and the grass and hair hanging down. A layer or two is a pretty good work for one day. So that it will take them a week to finish it, even if the weather is favorable and no accidents happen. But they are very persevering and very ingenious in overcoming difficulties. A pair once built a nest under a verandah where a wire bell-rope ran. The bell was not rung very often, but whenever it was rung it pulled the growing nest down. When it had fallen twice the birds rebuilt it in such a way as to leave an open tunnel right through that part of the nest where the wire was.

When they have finished the clay sides, they get fine, soft grass or other fibers and fill it nearly to the top. Then they put on a lining of downy feathers for their little babies to lie on. You can see some of the feathers at the top of the nest, and you can make out three baby heads peeping

out of the nest to greet their mother, who has just come to bring them something to eat.

But the insect mothers, as well as the bird mothers, cradle their babies in clay. A little green bee, not so large as a house-fly, builds a tiny cell of clay for each of her little ones. You see in the picture some of the cells made inside of a lock by her French cousin. The little mother bee picks



MASON BEE'S CELLS.

out some safe place and then brings a tiny bit of clay that she has worked over and mixed with a little fine sand and sticks it on the spot she has selected. Then she gets another bit of clay and lays it down beside the first and presses it firmly against it. And so she goes on all day long, bringing a new piece every minute or two and laying it in place till she has completed one of the little earthen jars you see in the picture. But her work is not done yet. She must go to the flowers and gather pollen and honey and mix them together and put the mixture—the bee bread—in the cell for her little baby bee. Then she lays an egg on the food and seals up the tiny jar, and when the baby wakes up she finds herself in a jar of honey and very sensibly begins to eat and to grow.

The wasps also make clay cradles for their little ones. The next picture shows two different wasps at work on such cradles. One of the nests is round, something like a sugar bowl, while the other is longer. The wasp at work on the longer nest is the South American cousin of the mud wasp that we have everywhere in this country. When I was a boy I used to see them come into the unfinished attic and make their mud cells on the boards and rafters, and this summer I found them doing the same thing up in Wisconsin.

The mother—for it is the mother always that makes the cradle for the wasp babies—finds some sheltered place and brings in her jaws lumps of clay about twice as large as her head and spreads the soft stuff down on the board. She works as hard as the little bee and soon has a cell between one and two inches long. When she has finished





MUD WASP'S CELLS.

one and filled it with the food her baby likes best she closes up the end, but makes that part much thinner than the rest of the cradle, so that the baby wasp will have no difficulty in getting out when he has grown up. Then the mother goes to work on another cell right beside the first one, but she does not forget the first one. If, while she is away getting clay for the second, you make a little pin hole in the first, she will at once notice it on her return and use the clay to stop it up, and if you break off a piece she will repair the place.

A man once stuck a tack into her nest while she was absent. When she came back she seemed very much surprised and worried by it. She ran back and forth around it with the bit of clay still in her jaws, as if she did not know what to do; but soon she dropped the clay and took hold of the tack and pulled until it came out. Then she closed the opening once more. On another occasion, when this gentleman broke open one of her nests in her absence, she took out all the food and put in a fresh supply before closing it up. She evidently thought something unusual had happened and she did not want her baby's food spoiled in any way.

#### CRADLED IN WOOD.

We have seen how the Mrs. Mason Bee packs her baby away in a jar full of honey, and now we have another bee—Mrs. Carpenter Bee—who puts her baby inside the trunk of a tree. She bores with her sharp mouth right into the wood, and when she has gone in an inch or so she turns her course downwards. Sometimes she makes her tunnel over a foot long, though it is very slow work for her. It sometimes takes her a month to

finish her nursery. She has to brush out all of the bits of wood that she bites off, and she generally carries them away from the tree, so that her enemies will not discover her nest from chips on the ground and steal her babies.

When she has made the tunnel long enough she goes in search of pollen and honey, like the mason bee, and makes a ball of bee-bread and puts it in the bottom of the tunnel and lays an egg on it. Then she takes some of the little chips she made and sticks them together and builds a little floor above the ball of food. On this floor she puts more food and another egg, and then builds another floor. She does this ten or a dozen times, making a cradle with many stories.

But her work is not over yet. You will see from the picture that the lowest baby is the largest, because it is the oldest. So the lowest baby must get out of this many storied cradle first. Consequently, when the mother has finished all of the floors inside, she goes down the outside of the tree to where the bottom of her cradle comes, and gnaws a hole into the wood to the lowest cell. This hole she stops up with chips stuck together in the same way she made the floors inside, and when her oldest baby is grown into a bee he can



CARPENTER BEE'S CELLS

gnaw out without any trouble, because he had such a thoughtful mother.

Still more thoughtful for its young is another bee, which makes its cradle in dry or decaying wood and then lines it with soft, green rose leaves. Mrs. Rose Bee, as they call her, cuts out little pieces from the leaves of roses, shaping them so that they will just fit the tiny cradle she has dug out of the wood. She takes from twenty to thirty pieces to line each little cell, and sometimes she has thirty cells in her nursery, making a





OAK GALLS.

thousand bits of lining she has cut out and fitted one by one to make her baby's cradle soft and smooth. So you can imagine what a busy little bee she is. Perhaps you have seen her sometimes cutting her bits of lining from your rosebush, or if you have not seen her, I am sure you must have seen the little round scollops she makes along the edges of leaves. She has a cousin who is even more dainty about the lining of her baby's cradle and cuts out bits from the red petals of the poppy to spread inside of her nest.

But the most wonderful cradle is the one that the gall-fly makes for her baby. You see the fly on the oak leaf in the picture, and you see the round balls growing on the oak branch. Those

round things are called galls and they are the cradles of the baby gall-fly. One of them has been cut open and you can perceive a tiny worm curled up cosily in the middle of it. That is the baby fly. And the cradle is not only a place of shelter, but it is also food for the little one—all of the food he needs until he grows up into a fly and leaves his nest. Then he will gnaw his way out, as you see one of the others has already done.

Do you ask me how the fly made this cradle? I cannot tell you. The fly's mother laid her egg in the bark of the twig and then left it there. But the oak tree went right to work and built up this beautiful little cradle, soft to lie in and juicy to eat. Did the mother ask the tree to do it? She evidently knew that her baby would be cradled and fed by the tree. She had found it out somehow, just as men have found out that if you put seeds in the ground they will grow up into more seed. But I do not suppose she said anything to the tree, any more than the farmer says anything to the earth when he puts the seed into the ground. Who, then, did ask the tree to cradle the tiny baby? and who taught it how to do it so well?

*Love is the fulfilling of the law.*—PAUL.

I have gone the whole round of creation: I saw and I spoke;  
I, a work of God's hand for that purpose, received in my brain  
And pronounced on the rest of his handwork—returned him again  
His creations approval or censure: I spoke as I saw.  
I report as a man may of God's work—all's love, yet all's law.  
—Browning.

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Get the help of some local student of science, if possible. "Homes without Hands" is a good book for the whole subject; "Introduction to Entomology," by Kirby & Spence, is a good work on all phases of insect life, in spite of its age. Packard's "Our Common Insects," or "Half Hours with Insects," give good accounts of our American insects. Dr. McCook's "Tenants of an Old Farm" is also admirable and includes spiders. The encyclopaedias will give help under "Spiders" and "Insects."

*In the Class Room:* Bring nests if possible. Have the children tell in their own words how the insects make their nests. Keep the purpose of the nests—as cradles for babies—in sight. Ask how the insects learned to do it, and suggest the larger Wisdom and Love that teaches and inspires all things. Ask them to learn and explain the verses. Let them bring in any galls or clay cells or other nests of insects the next Sunday. In preparation for next week's lesson let them put a pea to soak in moist earth and bring it with them.

*Outline of the Course for the Year:* It will be seen by the outline given below that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much

fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

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## Mother Nature's Children.

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### I.

#### CRADLING THE BABY.

The rose is queen among the flowers,  
None other is so fair;  
The lily nodding on her stem  
With fragrance fills the air.  
But sweeter than the lily's breath,  
And than the rose more fair,  
The tender love of human hearts  
That springeth everywhere.

The rose will fade and fall away,  
The lily, too, will die;  
But love shall live forevermore  
Beyond the starry sky.  
Then sweeter than the lily's breath,  
And than the rose more fair,  
The tender love of human hearts  
Upspringeth everywhere.—*Hosmer.*

It is not growing like a tree  
In bulk doth make man better be;  
Or standing long an oak, three hundred year,  
To fall a log at last, dry, bald, and sere.

A lily of a day  
Is fairer far in May,  
Although it fall and die that night—  
It was the plant and flower of light.  
In small proportions we just beauties see,  
And in short measures life may perfect be.

—*Jonson.*

Flower in the crannied wall,  
I pluck you out of the crannies;  
Hold you here, root and all, in my hand,  
Little flower—but if I could understand  
What you are, root and all, and all in all,  
I should know what God and man is.

—*Tennyson.*

#### CRADLED IN LEAVES.

The dear little girl in this picture has gathered some of the earliest flowers of spring and has brought them to her mother. She wishes to give them to her mother not because she does not care for them, but because she loves her mother more than she does the flowers, and she thinks they are the sweetest things she can find for a present. And I suppose you could tell me why she loves her mother so much. She is her mother's baby and her mother has held her in her arms and kept her warm, and fed her, and cared for her in every way.



But do you know that the flowers themselves are the babies of the plants on which they grow? The German artist who painted this beautiful picture calls it "The First Children of Spring," and I suppose he means that the flowers are those "first children." And they are really children, held in their mother's arms, for the leaves and the branches are the hands and arms of the plants. And a flower is only a lot of leaves that the plant has gathered into a sort of nest for its little baby. Instead of the branch growing long with leaves scattered on it at intervals, the branch stays so short that all its leaves





A ROSE WITH ROSE-BUSH GROWING THROUGH IT.

are in one place in order to cradle the baby. And the plant changes those leaves from green to red or white or some other pretty color, and makes them as soft and as sweet-smelling as any human mother could make the clothes of her baby's cradle. You can see from this picture of a rose-bush that the rose petals are really only rose leaves; for in this bush, after the plant had gathered its leaves into a nest, by some chance the bush went right on growing in the center of the rose. Above the petals of the rose are rose-leaves, and below the petals there are rose-leaves also, as if to show you that the leaves and petals were all the same. And sometimes instead of the pink or white petals of the rose you have greenish leaves right in the rose. I suppose the roses are all trying to change their leaves in the flower to petals, and some of them do it better than others.



A ROSE CUT THROUGH.

But the plant does more than just make a nest of soft, fragrant leaves for its babies to lie in. It takes one of its leaves and makes a little cup or

basket to pack the babies in so that they shall not fall out of the nest of petals. If you cut a rose right through the middle, you will see the tiny cup which the rose mother makes for her babies. You see such a cup in the picture, and the little, round specks at the bottom of the cup are the rose babies. You can find these little cups on the wild rose bush in the autumn. They are called rose-hips, and look like little red plums or apples, and are about as big as a small marble.

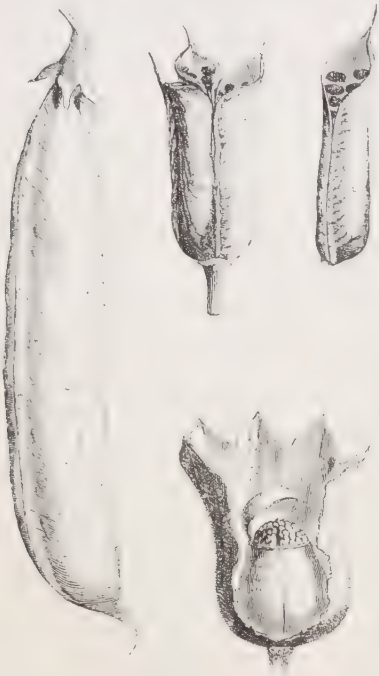
It is not easy for you to see how the rose mother makes a cup out of a rose leaf, because she changes the shape of the leaf so much. But in this picture of the pod of a marsh-marigold you can see that it was only a leaf folded together, with baby seeds on the edges of the leaf that are inside when it is folded up. You can fold a rose leaf for yourself and see how it is done—just as you see it in the picture. Or you can take a bean-pod like that in the next picture, and you will see that it is made of a folded leaf; and when it splits open, it splits into the two halves of the leaf. Sometimes several of such folded leaves are found in the same nest, as you see in the upper part of the picture, each of them full of tiny



A FOLDED LEAF. MARSH-MARIGOLD SEED VESSEL.

seeds, the babies of the plant. At the bottom of the picture you see another shape that the mother plant folds her leaf into, with a little cap on the cup, like a cradle with a cover to it to keep the babies in safely till they get old enough to take care of themselves. Then the mother plant takes off the cover and lets her children out, just as the mother pea twists open the pea-pod when her babies are ready to go out into the world.

So you see that all of the beautiful flowers that we love so much are only the nests that plants have made to cradle their babies in. They are the arms and hands of loving mothers clasping their little ones close to their breasts. We know that we ourselves make cradles for our babies because we love them. "The tender love of human hearts" is what impels us to cradle our little ones. And when we see the birds so fond of each other and of the babies in their nests, we



SOME SEED VESSELS.

cannot help thinking that the birds, yes, and the animals and the insects, too, have the same tender love for their little ones that we have. But when we see the flowers doing just the same thing for their little ones that we do for ours, can we help thinking that they, too, have something of that same tender love that we feel? and that they are trying to make a beautiful resting place for their little ones as we do for ours?

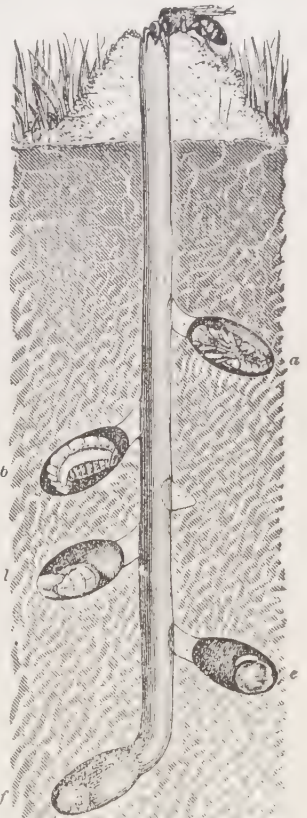
#### CRADLED IN EARTH.

Here is a bee that cradles her babies down in the ground. Mrs. Andrena, as she is called by the people who know her, is about as large as the bee that lives in the hive. Like the hive bee she sleeps through the cold weather of winter, but when spring comes, Mrs. Andrena wakes up, creeps out of her bed and goes flying over the fields to find a good place to cradle her babies. If you could sit down on the grass beside her some sunny day in May, you would see her digging slowly down into the ground, making a little round hole about as big as a slate-pencil. You see the little pile of earth she has brought up backwards, too—out of her nursery. If you watched her closely without frightening her, you would find that when she had dug down three or four inches, she stops her work in the ground and goes flying away over the fields, visiting one flower after another to gather pollen and honey and make bee-bread, just as Mrs. Mason Bee did,

you remember. After she had gathered a piece of bee-bread about the size of a pea, you would see her go on with her digging again, and bring up more earth. Then when she had dug down a few inches farther, she would stop once more and gather a little ball of bee-bread. So she would go on for several weeks, and if you should carefully dig up her nursery at the end of three or four weeks, you would find something like what you see in this picture. On each side of the tunnel there would be half a dozen little rooms.

Those are the cradles for the babies. The one nearest the top of the ground has the oldest baby, who, after eating for several weeks, went to sleep a worm and is about ready to wake up a bee. In the next lower cell you see a large worm who has just finished his bee-bread and is ready to go to sleep and wake up a bee. Below him is a still smaller worm eating and growing; and on the other side is a tiny white worm just beginning to eat and grow, while at the very bottom you see the ball of bee-bread our busy Mrs. Andrena had collected for her next baby, when you dug into her nursery.

But if you had not dug open the little home, but had staid beside it day after day, watching it carefully, you would have seen first one bee come out of the tunnel, then another, and then another, and so on till the whole half dozen worms had changed into bees with legs and wings and had come up out of the earth and gone flying away over the fields. It is almost as strange as a fairy tale, isn't it? A bee plants her tiny eggs down deep in the ground with a bit of bee-bread beside each one. Then the mother goes flying away to return no more, but the eggs wake up as little worms, eat and grow, down deep in the ground,



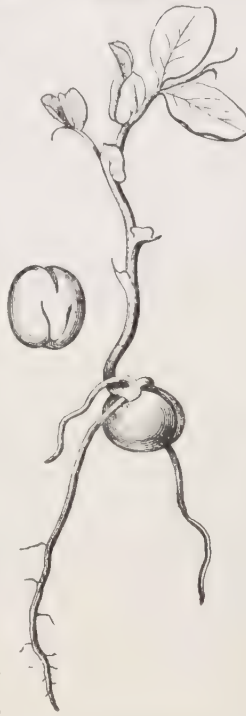
ANDRENA BEE'S CELLS.



—go to sleep and then wake up again as bees and climb out of the earth where their mother planted them, and go flying away like little fairies.

But bees and other insects are not the only things that are cradled in the earth. When a plant mother has cradled her little one in the soft, fragrant nest of leaves that we call a flower, she puts her baby to sleep and cradles him again in the dark earth. In the fall of the year you can see ever so many babies lying thus asleep on the ground where their mothers have put them. The next time you go out in the garden where the beans or peas have been growing, look sharply on the surface of the soil and I am sure you will find a bean or a pea lying near the foot of its mother plant. If you find a little round pea you may think it is dead, but it is not. It is only sleeping. It will lie there sleeping soundly through all the cold weather, wrapped up in a warm blanket of snow.

But when spring comes, if you watch it closely, you will see it wake up. Some bright, warm day you will find it has begun to send its tiny roots down into the ground and its little leaflets up into the air. If you could talk with the pea I think you would find it was quite a happy little fellow. It would tell you that it woke up in a nice nest with all it needed to eat and drink right about it, and the warm, bright sunshine spread over it. It had only to reach out its little fingers in the



PEA WAKING UP.

ground for food, and open its leaves to be supplied with rain and dew and sunshine. It was as well supplied as the little baby gall fly that woke up finding that a big oak tree had undertaken to care for it and was making it a nest that should shelter it and feed it at the same time.

So the baby pea finds that the earth itself is caring for it by making it a nest that holds it safely, and feeds it, and shelters it. The whole great earth seems to be such a nest, filled with new babies every spring. And the blue sky and warm sunshine seems to be brooding over the earth nest, like some great bird tending its little ones. And not only the plants and insects, but animals and men are all gathered together in that great nest of the earth and brooded over by that sky and sunlight. We should all freeze to death without that warm light, and we should all starve without the earth to feed us in its great cradle. And if our own mother cradled us and fed us because she loved us, may we not think that the Great Mother of us all also loves us?

*The eternal God is thy refuge, and underneath are the everlasting arms.*

### SUGGESTIONS TO TEACHERS.

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*In the Class Room:* Bring flowers and a pea that has begun to sprout. Get the children to describe what they see, in their own words. Get them to promise to find rose-hips or any other seeds to bring in the next Sunday to be explained. Develop the meaning of the verses in such way as you find best suited to your pupils. The younger ones can see that there is love all the way down to the very earth, and perhaps the older ones can be made to feel the wonder and mystery in a seed that can build up a plant with leaves and blossoms and seeds again. Ask them *how* they think it does it, and *who* directs it.

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## Mother Nature's Children.

*O Nature, gracious mother of us all.*—PRESTON.

### II.

#### TENDING THE BABY.

What does little birdie say,  
In her nest at peep of day?  
Let me fly, says little birdie;  
Mother, let me fly away.  
Birdie, rest a little longer,  
Till the little wings are stronger.  
So she rests a little longer,  
Then she flies away.

What does little baby say,  
In her bed at peep of day?  
Baby says, like little birdie,  
Let me rise and fly away.  
Baby, sleep a little longer,  
Till the little limbs are stronger.  
If she sleeps a little longer,  
Baby, too, shall fly away.—Tennyson

And hark! how blithe the throstle sings!  
He, too, is no mean teacher.  
Come forth into the light of things;  
Let nature be your teacher.—Wordsworth.

#### PROTECTING THE BABY.

"A Kiss First," is what the German artist, Meyer von Bremen, calls this beautiful picture of his. The little baby has just waked from his sleep in his cradle and he is hungry. His mother has an apple for him in her hand, but she says he must give her a kiss first before he can get the apple. I don't suppose she would starve him even if he should not give her the kiss, for she cared for him long before he could pay her by even a kiss. She has fed him and washed him and clothed him, not for the sake of kisses, but just because she loved him, and she would go on caring for him as long as he needed her care.

And we find the mothers among the birds showing the same unselfish, loving care for their children. If your parents keep hens, you must have seen how watchful the hen mother is of her little brood. She keeps them close to her by day and under her wings at night. She takes them about with her to get their food and scratches up the ground to help them find it. One mother hen was found one day on the other side of a deep stream



with all her chickens about her, and at night she was found back in the yard with her brood. Her owner wondered how she managed to get her babies across the water and so he watched her the next day. She went down to the edge of the water, and sitting down, clucked to her chickens. They all came up to her, and one of them—the bravest perhaps—jumped on her back. Then she got up carefully and spread her wings and actually flew over the water with her baby on her back. When she had alighted on the other side and he had jumped off to the ground, she left him and flew back to the rest of the little flock and took another one in the same way; and so she went on till she had carried them all over. Was not that a pretty good mother?

But she is as brave as she is thoughtful. If

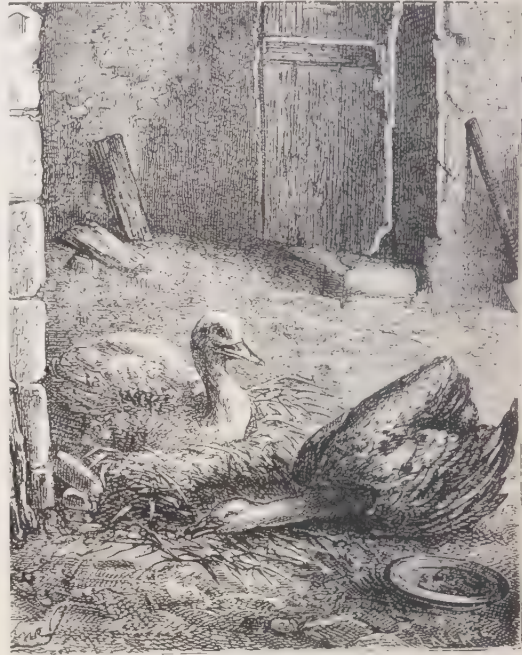


you try to take one of her baby chicks she will fly at you and try to strike and peck you. She will fight anything that seems to threaten harm to her loved ones. She will even fight a hawk, as you see her doing in the next picture, and drive him away, though she would run away herself if she did not love her little ones so much. It is her love that makes her brave.

The bravest are the tenderest.

The loving are the daring.

But the most thoughtful bird mother that I know of was a goose which Franklin tells us about. He says that this goose had made her nest in the kitchen of the farm-house and that she was the only one of the fowls that came in there to nest. But after she had been sitting on her eggs a few days she was seen to leave them and go out of the room and waddle slowly to the yard where the rest of the geese were. There she went up to a younger goose and after some quacking, she turned and walked back and the other goose came with her. She came into the

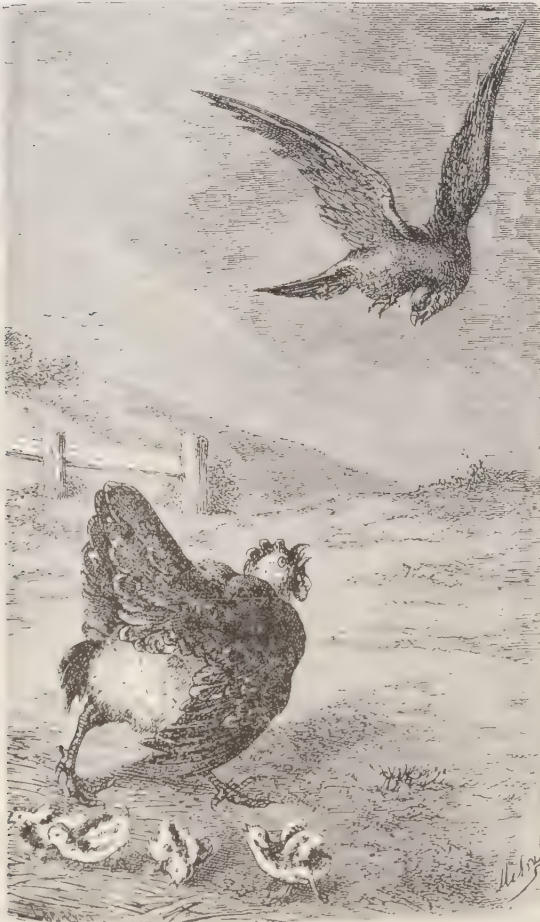


THE DYING MOTHER.

kitchen, followed shyly by the other goose, who had never been in the room before. Then the older one went up to the nest but lay down on the ground beside it, as you see her in the picture, while the younger one climbed into the nest and sat down on the eggs. In a short time the mother goose was dead, while the other remained and hatched the eggs and brought up the brood. That mother's love was strong, even in death, and when she felt that she could not live, she was determined that her babies should live, if she could get anyone to take her place.

#### FEEDING THE BABY.

I wonder if you know how many times a bird mother feeds her babies during the day. Of course she has her husband to help her, but even then she is kept very, very busy. I sat for five minutes in a boat under a cliff-swallow's nest this summer, and the parents came twice in that time to feed their little one, and they flew in so swiftly and stopped so short a time and went darting off again in such a hurry that I really pitied them, if they had to keep it up all day long. And men who have watched birds all day say that they are just as busy from before sunrise till the sun sets again. If the mama and papa birds come every three minutes, that would be twenty times an hour and three hundred times a day. Your mama and papa would be pretty tired



A HEN DRIVING AWAY A HAWK

if they had to feed you three hundred times a day. To be sure, there are three or four birds in every nest, so that would be only about one hundred times for each birdie. But even that would be a good many meals a day.

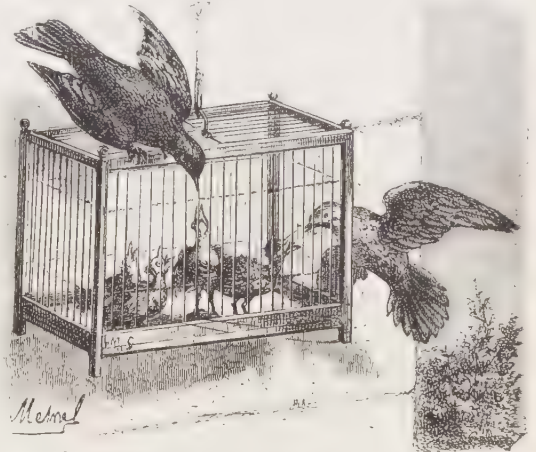
You see in the picture of the tailor bird two little open mouths waiting for the worm their mother has found and brought to them. She and her husband had to spend a great deal of time in making that fine nest. In the first place, they seek the strands of cotton fibre that grow on the plants, and twist it into a string with a knot at the end. Then they hold the edges of two leaves together and make a hole through the leaves with their sharp bills and push the strand through at the same time. You see how nicely they have done it, both in the front and the back of the nest. Then they had to find a lot more of the soft vegetable fibres for the birdies to lie on. You



THE TAILOR BIRD AND YOUNG.

can see it sticking over the edge of the nest. When they have done all that and have hatched out those two baby birds, then their hardest work really begins; for they must hunt near and far to find nice food to fill those two hungry mouths.

But I suppose they like to do it because they love their babies, just as a human mother likes to feed her baby even if she has to work hard to do it. And the birds will keep on feeding their little ones if you are cruel enough to take the baby



BLACKBIRDS FEEDING THEIR YOUNG IN A CAGE.

birds from the nest and shut them up in a cage. In this picture you see two blackbirds trying to put food through the bars of the cage that shuts their babies in. The father and mother had built their nest in a garden, and after their babies were nearly ready to fly, the owner of the garden thought he would capture the little ones and tame them. Mr. and Mrs. Blackbird were frantic when they saw the man come to their nest. They flew at his face and tried to drive him away, but he was too strong for them. He took their four little babies and shut them up in that cruel iron cage, where they cried piteously. The father and mother dashed themselves against the wires in a vain effort to break them and free their captive children. When they found that the wires would not break, they flew sadly off, and the man thought they had deserted their babies, but they had not. They had only gone to get them some food, and you see them reaching it in through the bars of their prison. But they could not care for their babies very well through the wires, and in spite of all that they could do to help them the little creatures drooped, and in a day or two their cruel jailer found them lying dead in the bottom of the cage. It was over in France that this sad event happened. But here in America a man did the same thing to some young birds. But when their parents came and fed them, they sat down beside the cage and wailed in such a heart-broken way that the man was touched at last, and he opened the cage and let the little ones out. And you should have seen what a glad family they were.





MENDING A BROKEN BOUGH.

**"WHEN THE BOUGH BREAKS."**

When the bough breaks the cradle will fall  
And down will come baby, cradle and all,

is the way the rhyme goes, but you will see from this picture that this is not the way things go in Birdland. Mr. and Mrs. Goldfinch do not intend to have their cradle and their little ones fall to the ground, even though the branch that holds the nest does break. They thought they had picked out a good tree for their home. They spent several days looking everywhere. It was their first experience in making a nest and so it was not easy for them to find just what they wanted. So Mr. Goldfinch suggested to his wife while she was resting, he should go by himself that, and search farther than they had gone before. In a short time he found what seemed the very tree they wanted. He hurried off to bring his mate and they came flying back together. Then the little lady perched on the spot her husband pointed

out to her, turned around in it to take its measure, examined the leaves above it to see whether they would keep the rain and sun away from her and her little ones, and then flew around the tree to see what her neighbors were like. All the time they kept up a constant murmur of pleasant twitterings, as they talked it over.

Every thing seemed just right, and they set about making their nest at once. When it was finished, the little lady bird sat brooding over the eggs for nearly a fortnight, while her bright husband sang sweetly to her from a neighboring bough, when he was not hunting through the town and country to find food for her. And at night he sat perched on the branch beside the nest, whispering words of love to her, no doubt. But when the little babies came out of the shells you should have seen how proud and busy they both were. But they found as their babies grew heavier day by day, that the branch settled lower and lower. It was a terrible day when they discovered that the bough was actually breaking. But Mr. Goldfinch loved his children very much, and as he was a brave, ingenious bird, he determined to tie the sinking branch to another stronger one not far away. And you see him in the picture pulling the strong branch up to the nest while Mrs. Goldfinch is tying it to the nest with fibres. And so the cradle did not fall.

*Can a woman forget her child, that she should not have compassion on him? Yea, they may forget, yet will I not forget thee.*

I know not where his islands lift  
Their fronded palms in air,  
I only know I cannot drift  
Beyond his love and care.—Whittier.

**SUGGESTIONS TO TEACHERS.**

*For Preparation:* Get the help of some local student of science, if possible. Romanes' "Animal Intelligence," in the International Science Series, is a good book for the whole subject. Wood's "Man and Beast" has many useful anecdotes of animals. Drummond's "Ascent of Man" will be suggestive.

*In the Class Room:* Get the children to tell you any instance of mother-love they know among the lower creatures, and to match it by human mother-love. Ask them whether they think there is any love better than their mother's; where they think the first mother got her mother-love; who was her Mother.

*Outline of the Course for the Year:* It will be seen by the outline given below that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any

hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

**MOTHER NATURE'S CHILDREN.**

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- X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

*O Nature, gracious mother of us all.*—PRESTON.

### II.

#### TENDING THE BABY.

As I walked over the hill one day,  
I listened, and heard a mother sheep say,  
"In all the world there's nothing so sweet  
As my little lamb with his nimble feet;  
With his eye so bright, and his wool so white,  
Oh, he is my darling, my heart's delight!"  
And the mother sheep and the little one  
Side by side lay down in the sun;  
And they went to sleep on the hillside warm,  
While my little lammie lies here on my arm.

I went to the yard, and I saw the old hen,  
Go clucking about with her chickens ten;  
She clucked and she scratched and she bustled  
away,  
And what do you think I heard the hen say?  
I heard her say, "The sun never did shine  
On anything like to these chickens of mine.  
You may hunt the full moon  
And the stars, if you please,  
But you never will find ten such chickens as these.  
My dear, downy darlings, my sweet little things,  
Come nestle now cosily under my wings."  
So the hen said, and the chickens all sped  
As fast as they could to their nice feather bed.  
And there let them sleep in their feathers so warm,  
While my little chick lies here on my arm.

— MRS. CARTER.

#### THE COW'S BABY.

The French artist, who painted this picture, calls it "Motherhood." He seems to think that the cow is a mother to her calf, just as the human mother is to her baby. You can see from the mother's face how much she loves her baby and how tenderly she cares for her. Though the mother herself is barefooted, she has taken her baby up in her arms so that she may not hurt her little feet on the hard road or get tired with the long walk. And I should not be at all surprised if she thought her baby was the sweetest and brightest and prettiest baby in all the wide world—just as the mother sheep in the poem thinks about her lamb, and the mother hen about her little chickens.

And I feel sure that the mother cow thinks the same about her calf, because she cares for him so tenderly and faithfully. She cannot carry him in



her arms and she cannot cosy him under her wings, but she takes just as good care of him as she can. She cleans him whenever he gets soiled in any way and feeds him when he is hungry, and she hides him carefully away from anyone that she thinks intends to take him from her. A farmer told me this summer of a bright cow who hid her calf from him. The cow mother was shut up in a small pasture and the farmer looked all over the pasture but could not find any traces of the calf. He was sure she had her baby there somewhere and so he pretended to go away but remained near enough to watch the cow; and soon he saw her go to a little clump of bushes and low softly, when out came her calf. The bright little fellow had kept perfectly still while the farmer was searching all about him and



almost stepping on him, because his mother had told him to, I suppose.

It almost breaks the heart of the cow to take her calf away from her. She will call for her baby in the most pitiful tones and she will go almost any distance to get back to her child. I remember in my boyhood going five miles to get a cow that had gone that distance to be with her baby. She had been sold and driven five miles away from her child and shut up in a stable; but when we went out to the stable in the morning she was missing. She had managed to work the door open in the night and had gone straight back to her calf, where we found her the next day.

But she will go much more than five miles to find her baby. A Frenchman says that during the last war the Germans drove the cattle away from the farms, and from one farm they took a mother without her calf. She refused to go and they could make her move only by cruelly pricking her with their bayonets. They drove her many days' march in this way, till at last she succeeded in stealing away from them one night. Then she came straight back the scores of weary miles she had been driven, without stopping to eat or drink, till she reached the farm, when she rushed through the yard into the barn where her calf was, calling it loudly on the way. She had been gone so long that the calf had forgotten her, and her milk had dried up so that she had no food for him. But she kissed him so tenderly and cared for him so constantly that he began to love her as much as ever.

### THE CAT'S BABIES.

I am sure that almost all of you have a cat or a kitten at home, and most of you have seen how fond the mother cat is of her kittens. But I do not believe you ever saw the cat jump into the

water, as you see her doing in the picture. She hates water worse than anything else in the world, yet a mother cat actually sprang into a stream and swam out into the deep water to save some of her kittens who had tumbled off from a plank into the water. She was a brave mother, wasn't she?

And she is as tender and loving as she is brave. If she thinks her kittens are in danger she will hide them so that no one can find them. I heard of a cat mother whose kittens disappeared from her home when a new dog came there to live, and it was found that she had carried them to a neighbor's barn two miles away. As she had five kittens, the mother must have traveled ten miles to get her babies in safety. Another cat, who had her kittens in a shed, carried them off when a certain rough boy visited the family. During the whole week of his stay no trace of them could be found, though their mother appeared regularly to get food. But the rough boy had been gone hardly an hour when puss came bringing her kittens back one by one. And another cat who had but one kitten, was seen to jump up with her kitten in her mouth, from the basement floor to an open drawer some feet above the floor, and put her little one in the drawer. Then she sprang back again and attacked a huge rat, larger than her kitten, and after a hard fight she killed it. Then she jumped up to her kitten with a pleasant call and took her back to her bed on the floor.

But a cat shows her kindness of heart especially in the way she will care for the kittens of other cats. She will even go and find orphaned kittens to tend. We had a remarkably bright cat once—a cat who used to unlatch doors, ring door-bells and open slides in the pantry. She came to me once and acted so excited and so eager for me to go with her, that I followed her out of doors and then into the stable. She took me to one corner of the stable, where she lay down beside three little kittens about a week old. She had no kittens herself then, and so she had no milk for these little strangers, and she jumped up and came to me as soon as they tried to nurse her. She evidently wanted me to get some milk for them and I did it, much to her relief. I found she had brought the kittens from a house in another block, where they had somehow lost their mother and had been heard crying for some time. Our tender hearted cat had been touched by their cries and had done all she could for them.



CAT SAVING HER KITTENS.

The tiger, too, is a sort of cat and she loves her babies as the domestic cat does. Some people



TIGRESS RESCUING HER CHILDREN.

in India found five little tiger babies left alone by their mother while she sought food for them. The men took three of the babies, thinking she would never miss them, and if she did, that she would stay with those that were left. But soon they heard the terrible roar of the mother, and they were so frightened that they opened the door of the building where the little ones were, and their mother carried them off one by one, as you see her doing in the picture.

#### BABIES PICK-A-BACK.

Babies always like to ride pick-a-back. The Indian mothers here in America used to carry their little ones that way, by having a sort of bag on the back to put the baby in. But the opossum mother in the picture carries her four babies on



OPOSSUM MOTHER AND CHILDREN.

her back without any bag to put them in. She has a little bag right underneath her body, and she puts her babies in there when they are first born. They are very tiny then and stay in the bag nursing and growing for several weeks. But when they get large enough to use their feet they come out of the bag and climb up on their mother's back, and you see how they fasten themselves there by twining their little tails about her large one which she bends up over her back for them. And so she can carry them around with her wherever she goes.

In the other picture you see another mother carrying her child on her back. It is a big mother with a big name. Hippopotamus is what they call her, a word that means River Horse, and she is more than ten feet long. She lives in



HIPPOPOTAMUS MOTHER AND CHILD.

the rivers of Africa and likes to wade and swim in the water. She will stay under water four or five minutes at a time, and then just stick her nose out of the water to breathe, as you see one doing right at the front of the picture where the air is blowing up two little jets of water. But when she has a baby she comes up much oftener to let him have plenty of air; and she carries him about on her back, as you see her doing in the picture. He does not look very pretty to us, but she seems to think a great deal of him. She makes a soft place in the rushes for him to lie in when he is too young to go with her, and when



he is older she keeps him with her and protects him against every danger. She will even attack men when she has her baby with her, though she will run away when she has no baby. One of these great creatures rushed upon a traveller in Africa recently and his Negro guide told him that she must have a calf close by; and sure enough they found a baby hippopotamus hidden away on the bank. She was determined no one should disturb her baby.

### THE BEAR'S BABIES.

The poor bear mother in this picture has lost both of her babies at once and she feels very badly over it, for she loved them dearly and cared for them tenderly. She had made a warm nest for them down deep in the snow, by lying close against a cliff and letting the snow fall over her till it buried her all up except a little breathing-hole. In this snow home the mother and her two babies passed the cold winter. But when spring came the baby bears were large enough to go about with their mother and eat the food she got for them. But one she found some walrus flesh close to an ice-bound vessel. She tore off some small pieces and gave them to her babies, but they had scarcely eaten the meat when some sailors fired at them with a gun from the deck of the vessel and killed both of the little ones and wounded the mother also. When she saw her babies lying motionless, she went to them and patted them with her paws, and with coaxing utterances tried to get them to come with her. Then she brought some more meat and tore it up and laid it beside them. When she found that they took no notice



WHITE BEAR AND CUBS.

of that, she went away some distance and then turned and began to call them in the most tender way to follow her. She did this twice, and when she found nothing could stir them, she went back to them and kissed them and caressed them with her paws, wailing as if her heart would break.

Another white bear mother was more fortunate with her little ones. When she found that the men on a vessel were trying to shoot them she urged them to run away as fast as they could; and when they grew tired, she went behind them and put her long flat head under the body of one and then the other and threw them ahead over the ice, and so escaped.

*He that dwelleth in love dwelleth in God and God in him.*

A thread of Law runs through thy prayer,  
Stronger than iron cables are;  
And Love and Longing toward her goal  
Are pilots sweet to guide the soul.—*Wasson.*

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Get the help of some local student of science, if possible. Help may also be found in "The Series of Nature Readers" by Wright, published by Heath & Co., or of "Natural History Readers" by Wood, published by the Boston School Supply Co., or any such series that is accessible.

*In the Class Room:* Get the children to see that all of these creatures follow the impulse of love, just as the human parents do, and that love is a safe pilot for the soul.

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## Mother Nature's Children.

### II.

#### TENDING THE BABY.

##### Part III.—Fish, Reptiles, Spiders.

I once had a sweet little doll, dears,  
The prettiest doll in the world;  
Her cheeks were so red and so white, dears,  
And her hair was so charmingly curled.  
But I lost my poor little doll, dears,  
As I played on the heath one day;  
And I cried for her more than a week, dears,  
But I never could find where she lay.

I found my poor little doll, dears,  
As I played on the heath one day;  
Folks say she is terribly changed, dears,  
For her paint is all washed away,  
And her arm trodden off by the cows, dears,  
And her hair not the least bit curled;  
Yet for old sake's sake she is still, dears,  
The prettiest doll in the world.

—Kingsley.

#### WATER BABIES.

The little girl in this picture seems to be giving her doll a bath. I suppose she remembers that her mother gives her a bath because she loves her, and so she thinks she will show her love for her doll by giving it a bath. But I fear she will find that the bath will do her doll more harm than good, because dolls are not made to put in the water. It spoils them to wet them. If she only had a doll-baby that the water would not injure she could put it in the water all she wanted to.

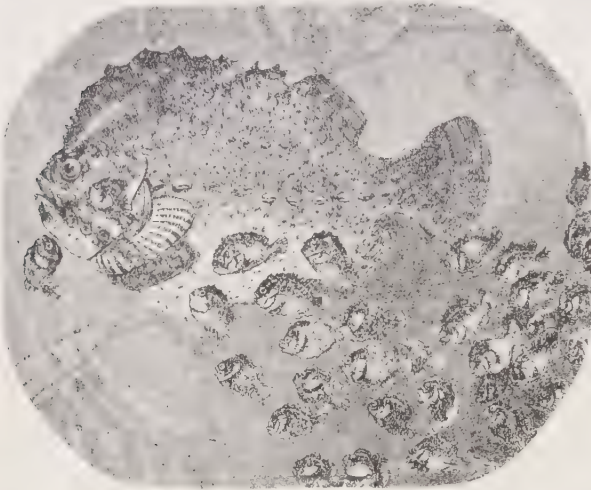
There are such water-babies in the world, real, live babies, and not merely dolls. In the first picture on the next page you can see a lot of such babies following their mother about in the water. They are baby fish and their mother, whom the fisherman call a Lumpfish, is very fond of them. I suppose you do not think she looks very pretty, but I dare say that her babies think she is a very pretty mother, because she takes such good care of them. She and her husband watch the tiny eggs before they are hatched, and the father covers them over with his big body so that no harm shall befall them. When the little water-babies have come out of the eggs and are able to



swim, they go wherever their mother goes, playing about her in the merriest way, and cuddling up close to her if they see anything that seems dangerous.

Mrs. Lumpfish and her babies are found in the ocean off the coast of Maine, but in our fresh-water streams we have fish mothers who tend their water-babies in the same way. We sometimes see the sunfish and her brood swimming about as Mrs. Lumpfish does. A gentleman once held his hand in the water as Mrs. Sunfish and her babies came along. The mother stopped when she saw the fingers. She evidently knew what a hand was, and that there was probably a man back of it, and she had learned to be afraid of a man. But her little water-babies came swimming fearlessly up to the hand and began to





36 THE LUMPFISH WITH HER CHILDREN.

nibble the fingers to see whether they might not be good to eat. The mother was very much worried by the careless conduct of her children and moved nervously about at a distance from them. But when the man began to slowly close his fingers over the little fish, as if he would catch them, the mother could stand it no longer. She rushed at the man's hand so suddenly and hit it so hard that, though she did not hurt him, she startled him so that he lost his balance and almost fell into the water. She might be afraid of a man, but she wasn't going to let him steal her babies if she could help it.

But fish have other ways of protecting their little ones. Sometimes the parents will take the children all into their mouths, as you see them doing in the second picture. *Ophiocephalus* is the long word the scientific men have given to these fish, a word made up of two Greek words, mean-

ing "snake-head." So we will call them snakehead for short. Mr. and Mrs. Snake-head seem to think a great deal of each other, for you generally see them together. They build quite a nice nest for their babies, using straw for the frame, and covering the straw over with mud. The father and mother watch over the little ones very carefully and do not allow them to come out of the nest till they get strong enough to swim quite well. Then they go around with their brood, and if they see a dangerous fish or a man's hand, they open their mouths and in half a second all the tiny fish have disappeared, stowed safely away inside their parents. I suppose if the parents had any arms they would use them to hold their children, but as they have'n't any arms, they make their mouths do instead.

They use their mouths also to make their children mind, not by scolding them, as we sometimes do, but by catching them in their mouths. In the case of one of the fishes, the Stickleback, I believe, the father alone tends the babies, and he tries to keep them in the nest, or close to it, because if they get away beyond his reach they will be eaten up by some big fish or other. So when Mr. Stickleback sees one of his numerous children going away too far, he rushes after him and opens his mouth and takes him in. Then he turns around and squirts the little fish out toward the nest. And if the little fellow does not take the hint even then and stay at home, the father will shut him in the nest by pulling the straws down over the opening. So you see what a busy

time of it a fish father or mother must have with a hundred children to look after, when they all like to play and get into mischief as much as you do.

But fish are not the only water-babies, by any means. The Alligator is another mother who takes her babies in the water, though they are born on the land and breathe air, as you and I do. The mother makes a nest for her eggs; for she lays eggs like a bird. She brings sticks and leaves in her big mouth to some safe place among the reeds on the bank of the river, and when she has laid her eggs she covers them over with more leaves and stays by them to keep them from harm.

When they are hatched she leads the little alligators to some quiet little pool with sunny



THE OPHIOCEPHALUS AND THEIR YOUNG.



38. ALLIGATOR MOTHER AND CHILDREN.

banks of sand for them to play in and bask on; and if you should steal softly to the place without frightening her, you would see her lying, as she is in the picture, with her babies climbing all over her in a slow, sedate sort of sport. But the moment they heard you they would all scramble into the water and vanish from sight. If the little ones were too small to take care of themselves and get out of danger she would open her big, big mouth and take them out of harm's way, just as the fish do. A man once found a lot of baby alligators on the bank of a river and took one of them to carry home with him. But he had hardly picked it up when the mother alligator lifted her head from the water and bellowed at him, and in half a minute a dozen other big heads were lifted out of the water, all barking and snapping at him and all making their way towards him. So he was glad to drop the baby alligator and hurry off beyond the reach of its angry mother and her friends.

You can see from the other picture how care-

fully the mother alligator protects her babies from the birds of prey. The bodies of the little alligators are soft and tender, not hard and scaly like their mother's, and so the hawk likes to get a baby whenever he can. This time the mother seemed sleeping on the sand with her little ones playing carelessly about her. But if she was asleep she waked up very quickly when

she heard the sound of the hawk's wings, and you see she is gathering her little ones close to her and is facing the hawk. He will have to eat her before he can eat her babies.

### BABIES IN A TENT.

A tent is something that babies always like to be in, and so I suppose that those baby spiders in the next picture must be having quite a jolly time, for they are living in a tent made of silk. You can see their mother sitting inside the tent, while her little ones are running all around, and one of them has spun a thread and let himself down from the oat-stalk on which the tent is pitched. And where do you suppose the tent came from? Mrs. Spider made it all herself. She spun the silk and wove it together and pitched it in the branches of the stalk of an oat plant. When she made it for her babies, it did not have that large opening in it. A man tore it open to see what was inside, and as soon as she could she closed it up by weaving some more silk over it.

A lady here in America found a tent something like this, only it was made of two smilax leaves fastened together by the silk threads of the spider mother. The mother was away from home when the lady discovered the nest. So she pried it softly open and many of the little spiders came running out, like children out of school. Soon Mrs. Spider came home and seemed greatly surprised at what had happened. First she tried to pull the tent together again by spinning threads from one leaf to the other. But she found that this was going to take so much time that her children would get lost unless she looked after them first. So she ran about gathering them in one after another, bringing some of those who had strayed farthest in her mouth. The lady put her pencil in and the spider sprang at it and then at her hand, evidently thinking that this strange creature wished to harm her babies, and three days later she came and pulled the tent open farther. This troubled Mrs. Spider exceedingly and she ran all about the place in an angry, excited manner, as if trying to find the cause of the harm.



39. THE ALLIGATOR DEFENDING HER YOUNG.



Then she went to work in the most determined way to close up the opening, and the next morn-



40. SPIDER MOTHER AND LITTLE ONES.

ing it was all repaired. The industrious little mother had made her babies' tent all right again.

She also feeds her babies as well as shelters them. If you find a nest without the mother and

stay to watch it, you will see her come back bringing a fly in her mouth. She will settle down among her babies and half a dozen of them will begin to eat the fly with her. I found such a nest one morning this summer and dropped a fly into it within reach of the mother. She sprang upon the fly and dragged it among the little ones and held it fast while her babies gathered about and began to eat. With a hundred babies to feed and care for she must be quite a busy little mother and has to work hard, no doubt. But if she loves them, I suppose she enjoys working for them, as your parents enjoy working for you.

*But ask now the beasts, and they shall teach thee;  
and the fowls of the air, and they shall tell thee.*

*Speak to the earth, and it shall teach thee; and  
the fishes of the sea shall declare unto thee.*

And there is never a leaf nor a blade too mean  
To be some happy creature's palace.—*Lowell.*

Let me go where'er I will,  
I hear a sky-born music still:  
It is not only in the rose,  
It is not only in the bird,  
Not only where the rainbow glows,  
Nor in the song of woman heard,  
But in the darkest, meanest things  
There alway, alway something sings.

—*Emerson.*

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Besides the books mentioned in No. 2, "My Garden Pets," and "Home Studies in Nature," by Mary Treat, are excellent for the Spider. For the Fish, an article in the Popular Science Monthly, Vol. 32, p. 776 is excellent.

*In the Class Room:* Help the children to see the truth in Emerson's lines; make the Nature Studies, in all the lessons, as far as possible, only an illustration of this unity of life. As preparation for the next lesson, ask the children to soak a few kernels of corn and bring them next time.

*Sources of the Illustrations:* Care has been taken to select the pictures from artistic and reliable sources only. It was a part of the original plan to put the sources in each number. The first number, however, was so full that they had to be omitted, but hereafter they will be inserted regularly. In this number the picture on the 25th page is "The Doll's Bath," by G. Igler. Nos. 36 and 37 are from the Popular Science Monthly, Vol. 32, by the kind permission of the publisher of this most excellent magazine. No. 38 is from "Queer Pets at Marcy's," by O. T. Miller, an interesting and helpful book. No. 30 is from Menault, *L'Amour Maternel chez les Animaux*, a book from which I have drawn largely. I have found the French books much more useful for illustrations than any others. In Lesson 1 of the series the picture on page 2 is from Pouchet, *The Universe*, though originally from Gould. The Oriole is from Wood's *Natural History*, Vol. 2, a helpful work in the large edition. The Titmouse is from Pouchet, and the Weaver from Michelet, "The Bird." In the second number, the Squirrels are by S. J. Carter, a well-known English painter of animals. He calls it "A Little Frehold." The Mousenest is from Menault; the Crowned Spider from Brehm's *Tierleben*, the best work on

natural history I know. The Stickleback's nest was taken from Buckley's *Winners in Life's Race*, though not original with her. Her three works, *The Fairyland of Science*, *Life and Her Children*, and *Winners in Life's Race* are perhaps the best in English to inspire interest in zoological studies. In Lesson 3, the half-tone is by M. Laux, a French artist who has painted several fine pictures of birds. The Bee's cells are from Figuier, "Insects;" the Wasps from Wood's *Homes Without Hands*; the Carpenter bee, from *A World of Wonders*, published by Appleton; the Oak Gall, from Jones's *Natural History*. The fourth lesson has its half-tone from a picture by G. Schachinger; the Rose with a bush growing through it is from Zimmermann's *Botanik*, Vol. 1, while the rose cut through is from Figuier's *Vegetable Life*, as is also the picture of some seed vessels. The folded leaf and the peas are from Gray's *Botany*; the bee's cells is from Packard's *Our Common Insects*, an excellent work because it deals with American species. All the pictures in No. 5 are from Menault, except the Tailor Bird, which is taken from Figuier.

*Outline of the Course for the Year:* It will be seen by the outline given before that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### II.

#### TENDING THE BABY.

##### Part IV.—Insects and Seeds.

And Nature, the old nurse, took  
The child upon her knee,  
Saying, here is a story-book  
Thy father hath written for thee.

Come wander with me, she said,  
Into the regions yet untrod,  
And read what is still unread  
In the manuscripts of God.

And he wandered away and away  
With Nature, the dear old nurse,  
Who sang to him night and day  
The rhymes of the universe.

And whenever the way seemed long,  
Or his heart began to fail,  
She would sing a more wonderful song,  
Or tell a more marvellous tale.

—Longfellow.

#### NURSING THE BABY.

The baby in this picture seems to be thoroughly enjoying himself. He has his food just to suit him. He hasn't many teeth, and the few he has are not strong enough to chew the food you and I eat, and his little stomach is too weak to digest it and make flesh and bones out of it. So if he is not going to starve to death, somebody must prepare his food for him. And somebody loves the dear little fellow well enough to do it, as you see from the picture. Whether she is his mother or only the nurse, the artist does not tell us, and I do not think it makes much difference to him as long as she loves him so dearly and cares for him so faithfully. And where do you suppose she got the food? Perhaps it is milk which some cow was kind enough to let her have, or perhaps it was some nutritious flour which men have invented for babies and which she bought and mixed with warm water for her little nursling.

But men and women are not the only creatures that love their little ones well enough to prepare such food for them. In the first picture on the next page you will see a mother bird—the Penguin—feeding her little one with some food she has prepared for him. She hasn't any glass



bottle or rubber tube, but she has inside of her body a vessel and a tube made of tissues something like our stomach, and Mrs. Penguin fills that vessel with food she has prepared for her baby. She herself eats fish which she catches in the ocean, for she lives on the seashore and swims and dives very skillfully, though she cannot fly at all because her wings are so small. She lays only one egg and does not make any nest for it but carries it about with her in a soft, warm pocket that she has under her wing. While she is carrying the egg she cannot go into the cold water because that would chill the egg, so Mr. Penguin catches fish for her during that time. But when her little one has come out of the shell, she has to give him something to eat. He can-





42. PENGUIN MOTHER FEEDING HER BABY.

not eat the fish as she does, for she swallows them whole and alive, bones and fins and all. Her baby's little stomach could not stand that. So she takes the fish she has caught and swallowed and separates the flesh from the bones and fins and mixes it up with a fluid that makes it something like milk. She fills the vessel she has inside of her throat with this mixture and brings it home to her little one, and you see him in the picture getting his supper out of this natural milk-bottle. Nearly all birds do this for their young.



43. ANT NURSES TENDING BABY ANTS.

This last August I saw the young robins and blue-jays following their parents about, asking to be fed in this way with a sort of birds' milk. And as long as they need it their parents will furnish it to them, for the father as well as the mother has this milk vessel.

In the next picture you see some little creatures which also nurse their babies, just as the birds do, and they keep little cows, as it were, to furnish them with a sort of milk, just as we do. The little white bundles, you see in the picture, are their babies. They have brought them up from their underground nursery to give them the air and sunlight. They bring them up every pleasant morning for this purpose, just as you see human nurses taking their babies out in pleasant weather. But when the sun grows too hot, they carry the babies below, as you see some of them doing in the picture. And when the sun sets and it gets colder, these careful little nurses will carry their little bundles down still farther in the ground, where the cold cannot reach them. And if a rainfall floods their home or the foot of a passer-by crushes it, you will see the nurses doing everything they can to save their precious charges. Perhaps you have seen them running about, each with one of these white bundles in her mouth,—for she carries the baby in her mouth as a cat does. And if you ever caught one of these nurses and tried to take her bundle away from her, you would find that you could not pull the baby away without pulling the nurse's head off.

And these nurses have their little bottles of prepared food as the birds do. If you could look into their dark homes you would see a nurse going from one baby to another and stooping over each one as she comes to it. The little, white, bag-like creature lifts its brown head as the nurse comes, and opens a wee bit of a mouth that hasn't a sign of any teeth in it. Of course such a mouth could do nothing with the bugs and flies that ants live on. So the nurse chews up this coarse food and makes a sort of milk of it, and when the little white baby opens his mouth she gives him a drop from her milk-bottle, which makes a meal for him. But he has to be fed very often, just as the growing birds do, so that you can imagine how busy an ant-nurse must be.

And besides feeding the babies and carrying them upstairs and downstairs, she has to give them baths every little while to keep

them clean; for you never will find a speck of dirt on them, though they live in the dirt. And even after the babies have grown up, the nurses still look after them, showing them about the rooms of the ant-hill and over the paths leading from it and seeing that they get home safe the first few times they go out. I found one of these younger ants outside of an ant-nest this summer and I caught him and held him so that he could not easily escape. Then I put my hand so that one of the nurses should come to it. In a moment the nurse had spied the young ant and the two held an animated conversation with their feelers. After that the nurse took hold of one of the feelers of the young one and began to pull him toward the hill, and then she seized one of his legs and pulled. She pulled so hard that I was afraid she would pull his leg off, and so I let go my hold of him. Then the nurse carried him off to the hill and down into it. She wasn't afraid of me, but he seemed to think that a giant like me was not the best company for the younger members of her family.

Another nurse whose acquaintance I made this summer is seen in the next picture. I lived for two weeks in the same room with this wasp and her nest. She had made it originally in another

another of the cells containing babies and put her head in each cell and hold it there quite a while. If you looked into one of the cells as soon as she took her head out, you would see the fat little baby's mouth going as if he were eating something that he liked very much. In my room there was another of these wasp's nests which had ten or fifteen nurses busy making new cells and nursing the babies. I thought it would be a kindness to put one of these nurses on the nest which had but one. The new nurse went to work at once, feeding the little babies in the kindest way, but the moment the old nurse saw this newcomer, she sprang at her as she did at everything else that threatened her babies. And she drove her off in spite of my efforts to prevent it, so jealous was she of the welfare of her little ones.

But plants as well as insects and animals prepare food for nursing their little ones. If you take a kernel of green corn, as it is in cans, or if



44. A WASP NEST AND A WASP NURSE.

room, and when it was threatened with destruction I rescued it and hung it up in my chamber. The wasp at first seemed inclined to resent my well-meant attempt to help her. She was very nervous while I was taking the nest down, and ran rapidly around it and threatened to sting me, but after she got settled in her new quarters she was quite willing to be fed by me. You will see that she has built quite a number of cells and in each one, as soon as it is finished, she puts an egg. Soon the egg hatches into a little worm, with a tiny black head and a hungry little mouth, which has to be filled very often. There were half a dozen little baby wasps in different stages of growth when I took the nest, and after I gave the wasp a piece of beetle to eat, she would chew it up very carefully and then go from one to



45. THE BABY CORN AND ITS MILK

you soak a dry kernel for a few days, you will find it is made up of two parts, as you see them in the upper portion of the picture of the corn-baby's milk. You see there a kernel of corn cut through flat-wise, and another cut through cross-wise, showing the little baby plant inside



the kernel. That plant is represented by itself at the right of the picture. The mother has cradled it during the warm summer in her nest of leaves which we call husks. But besides cradling it, she has prepared some food for it, and you can see that food in the larger and upper part of the kernel. If you pick an ear of corn before it is ripe, you will find that the kernels are full of a white fluid, looking like milk. I believe the farmers say that "the corn is in the milk" at that time. Well, that "milk" is food which the mother has made for her baby to eat next spring when he starts to grow after his winter's sleep. She seems to know that a baby plant, like a baby insect or a baby animal, cannot, at the very first, eat the coarse food she does. So she chews up, as it were, her food, and makes it into a very nourishing fluid that the tiniest baby plant can eat.

But she will be dead and gone when her baby wakes up another year and wants his food. Therefore she dries up the milk into what men have called "albumen." It is a sort of condensed milk, so condensed that it has become solid. And she puts her sleeping baby right in the condensed milk, as you see in the picture. She acts something as a human nurse does who puts the baby to sleep with a bottle, only the corn-mother puts the baby to sleep first and then puts him beside the bottle, so that when he wakes he will find it there all ready for him. The rain of spring will soften it and he will find it changing again into milk for him, and he will use that milk to help him grow till he gets roots and leaves of his own, which will enable him to procure new food from the earth and the air. Do you not think that the corn-mother is very kind and thoughtful? And how do you suppose she ever came to know that her babies would wake up and need food after she was dead? And who will tend all of these babies of hers next year? Who tended all of the motherless baby seeds this year?

In the last picture you see a beautiful, white-winged butterfly. She has just laid her eggs on the leaf at the bottom of the picture,—a little



46. A BUTTERFLY MOTHER AND HER BABIES.

pile of tiny yellow balls,—and now she is flying away. She will never come back to tend her hundred little babies. Yet they will wake up and make their way out of the eggs in which they sleep, and they will find food and grow somehow, till they change each into a chrysalis such as you see fastened to the branch just above the eggs, where it will sleep through the winter and come out a butterfly next summer. All of the butterflies leave their babies in this way. And who do you suppose cares for the babies? Who wakes them, feeds them, watches over them, and tells them when and how to tuck themselves in for their winter's sleep? Does it not seem as if somebody was caring for these babies, just as somebody cares for the seed-babies, and all the other motherless babies with which the whole wide world is filled?

*And all of you are children of the Most High.  
And his tender mercies are over all his works.*

Stern law giver! yet thou dost wear  
The Godhead's most benignant grace;  
Nor know we anything so fair  
As is the smile upon thy face;  
Flowers laugh before thee on their beds,  
And fragrance in thy footing treads.  
Thou dost preserve the stars from wrong;  
And the most ancient heavens through thee are fresh  
and strong.  
—Wordsworth.

#### SUGGESTIONS TO TEACHERS.

*For Preparation:* Lubbock's "Ants, Bees and Wasps" is probably the best work on these insects, though White's "Ants and Their Ways," is also good, and Buckley's "Life and Her Children" has a chapter on Ants. Get an old wasps' nest to show the children. Dr. McCook's "The Agricultural Ant," and "The Honey Ant" are both excellent.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see; then tell them what the insects do, or if the pupils are old

enough, let them read the text. If you can plan to visit an ant-hill with the children some week-day, that will make the lesson still more real. Emphasize the love and care that must exist even where there is no actual mother, and so get them to feel the presence of a great Care-taker for all things.

*Sources of the Illustrations:* The half-tone is "Golden Babyhood," by R. Epp. Nos. 42 and 43 are from Menault; No. 44 from Figuier's Insects; No. 45 from Gray's Botany; No. 46 from Martin's Naturgeschichte. Vol. 4, a work that has many excellent illustrations.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

# Mother Nature's Children.

## III.

### SETTING THE TABLE.

#### Part I.—Birds.

##### THE SANDPIPER.

Across the lonely beach we flit,  
One little Sandpiper and I,  
And fast I gather bit by bit,  
The scattered drift-wood, bleached and dry.  
The wild waves reach their hands for it,  
The wild wind raves, the tide runs high,  
As up and down the beach we flit,  
One little Sandpiper and I.

I watch him as he skims along,  
Uttering his sweet and mournful cry;  
He starts not at my fitful song,  
Nor flash of fluttering drapery.  
He has no thought of any wrong,  
He scans me with a fearless eye;  
Stanch friends are we, well tried and strong,  
The little Sandpiper and I.

Comrade, where wilt thou be to-night  
When the loosed storm breaks furiously?  
My drift-wood fire will burn so bright!  
To what warm shelter canst thou fly?  
I do not fear for thee, though wroth  
The tempest rushes through the sky;  
For are we not God's children, both,  
Thou, little Sandpiper, and I?

—*Celia Thaxter.*



##### OUR TABLE.

I do not believe that this little girl's mother is in the room, for if she were, she would not let her little daughter feed the cat on the table and out of the same spoon she herself uses. The mother would say that she set the table for her own family, but not for cats and dogs to eat from. She will give the cat and the dog something to eat after she and her family have finished their dinner; but if she allowed cats and dogs to help themselves first, it is very likely that there wouldn't be anything left for her and her family. Certainly there would not, if she let all the cats and dogs in town eat first. And if every mother let all the cats and dogs in the world help themselves first, there would not be any food left for boys and girls and men and women, and they would die of starvation, and this world would be filled full of cats and dogs instead of men and

women and dear little girls and boys. And that would be very bad, wouldn't it?

So you see we have to set the table for ourselves and keep the cats and dogs away till we have eaten what we need. Then we can give them what we have left and set their table on the floor, as it were. But who sets the table for all the wild creatures which do not live in our homes and share our food, like the squirrels in the woods, and the birds and butterflies in the air, and the fish in the water? And you know we buy our food at the meat-market and the grocery store, or if we live on farms, we raise it by planting seeds in the ground or feeding poultry and cattle to use on our own tables. But where are the meat-markets and the grocery stores of the birds and fish and insects? And where are their farms? And who plants them and cultivates them? I suppose there are at least a thousand times as



many other creatures in this world as there are men and women and boys and girls, and so there ought to be a thousand times as many stores and farms to furnish them with food, and a thousand times as many tables set morning, noon and night. Just think what a lot of housekeeping must be done by somebody.

### THE BIRDS' TABLE.

For a week or two this summer I lived where I could almost step from the door of my room to the top of a cliff overlooking long stretches of quiet water. On the face of the cliff, right under my feet, were dozens of swallows' nests, and whenever I went to the top of the cliff I used to see the swallows sweeping swiftly back and forth over the still water. What do you think they were doing? If you will look at the picture of the swallows at dinner, you will see what they were about. They were catching flying insects. I could not see anything but swallows from the top of the cliff, but as soon as I went down to the edge of the water I was surrounded by a perfect cloud of hungry mosquitoes, eager to eat me up; and the birds were eating those mosquitoes up. That was their breakfast and dinner and supper. That quiet water was the table set for them. It was sending up out of its depths a stream of dragon-flies, mosquitoes and other winged insects,



19. WOODPECKERS AT DINNER.

and all that the birds needed, to get their food, were wings swift enough to overtake the insects, and mouths opening wide enough to take them in so that they could scoop up insect after insect, till each bird packed hundreds away in his mouth. If you could catch one of the swallows when he had been taking his dinner in this way, and open his mouth, you would find a round, solid mass of insects in the back of his mouth, something like a marble in size and shape. That is his share of the dinner set on this watery table, and he had to earn it by hard work.

In the next picture you see another family of birds at dinner the woodpeckers. On this same cliff, from which I watched the swallows, there was a pine grove, and sometimes I would sit down on the carpet of pine-needles for half an hour. As soon as I got quietly seated, I would hear a knocking as if somebody wanted to come into my pine room; and looking in the direction of the sound I would see a greenish bird climbing rapidly up and down one of the pine trees and stopping every second or two to give a few knocks with his sharp bill upon the trunk or branches of the tree. When he had gone over one tree he would fly to another, till he had visited sometimes a dozen in as many minutes. That was the Green Woodpecker getting his dinner. The pine grove was his dining room, and not his alone, but the dining room of all the green woodpeckers in the forest, for nine came in succession within



48. SWALLOWS AT DINNER.

half an hour the first time I went there.

They have a sort of pine table for their dinner. For instead of its being flying food spread over the water, it is creeping food hid away in the worm-holes of decaying trees; and the birds must have a pretty sharp bill to get it out, as you see from the ivory-billed woodpecker in the picture. They use their head and bill as a sort of pickaxe to pick the bark off and drill a hole into the dead wood where the worm is. And if they cannot quite reach the worm with their bill, they have a long tongue to thrust into the hole and stick fast to the worm and draw it out. This ivory-billed bird is so large and strong that he will sometimes knock an old tree trunk all to pieces to get out the worms.

They are hammering and chiseling all day long in his search for food. You will see one of them strike a tree, and then listen with his head tipped over on one side. If he hears a worm stirring inside the tree, he chisels straight in to it and gets it, but if he hears nothing, he hops to another hole and strikes and listens once more. And so he works from morning to night, finding his table set for him, as the swallow does, but finding that he must earn his food before he can get it.

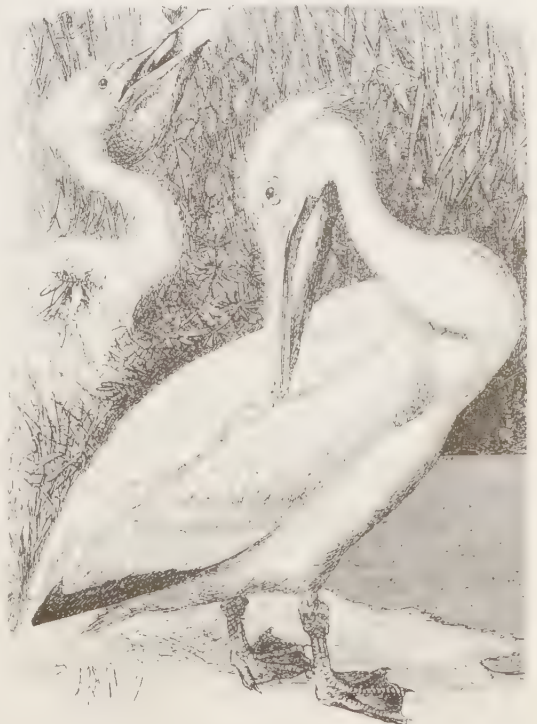
But the humming-bird has a nicer table than either the swallow or the woodpecker, for his table is set on flowers and in them. You see from the picture that his bill is long and slender, and just fitted to reach into the flowers to the very bottom, and he has a dainty little tongue that he can thrust out beyond the end even of his long bill. He darts from flower to flower, thrusting his slim beak into each and sweeping off the tiny insects that live inside of the flowers; and along with the insects he takes a sip of the honey that is found deep in the flower. So he has something to eat as well as to drink, and he seems to like the honey best. A gentleman tells us how he caught one of these beautiful birds one day and it pretended to be dead. He says: "It lay on my open palm motionless for some minutes, during which I watched it in breathless curiosity. I saw it gradually open its bright little eyes to peep whether the way was clear, and then close them slowly as it caught my eye upon it. But when" a mixture of sugar, honey and water was brought and "a drop was touched upon the point of its bill, it came to life very suddenly; and in a moment it was on its legs, drinking with eagerness of the refreshing draught from a silver teaspoon." It was so fond of the drink that it



50. A HUMMING-BIRD AT BREAKFAST.

would come from any part of either room and alight upon the cup containing it. It came back after it was allowed to fly away, and even a year later returned with its mate to get some more of the sweet drink. It liked to have its table set for it without the trouble of going to so many flowers.

The water also, is filled with food for the birds. In the picture of the pelicans you can see the tail



51. A PELICAN AT DINNER.



of a fish sticking out of the mouth of the further one, and you can see what a big bag the bird has under her chin. That is her fish-basket and holds almost a pailful of water. When the pelican is hungry she goes flying out from the land and hovers over the water till she sees a fish. Then she sweeps down from the air into the water with her great mouth wide open and scoops up the fish, or a dozen of them if she can find as many together. When she has caught enough she goes flying home again with her fish-basket well filled and sits down on the shore and dresses her feathers, as you see one of them doing in the picture. But as soon as she has digested her meal she has to go fishing again for another meal. So you see she earns her food as much as the other birds do.

And there are birds that get their food out of the ground as well as out of the water. You must have often seen the hens scratching up the earth and picking bits of something from it. Sometimes you will see the robins on the lawn, especially in the early morning, pulling and tugging at something in the ground. If you watch one of them closely enough you will see him, after a hard pull, pick up an angle-worm and fly off with it wriggling in his beak. Some one who watched a pair of robins that had a nest in sight says that they brought three thousand earth-worms during the time they occupied their nest.

In the last picture you see the bobolink, whose bright colors and gay song make him such a delight to us all. In the picture I believe he is perched upon a rice straw, but here in the north, where we have no rice plants, you will see him swinging on a thistle or any other weed strong enough to bear him, and eating the seeds and caroling his merry song. He finds his table spread with the seeds of the grasses and thistles and dandelions, and all the other weeds. It almost seems as if the weeds planned to furnish the birds



52. BOBOLINK AT DINNER.

with seeds, for each weed, like a thistle or dandelion, produces hundreds of seeds. One of those seeds is enough to start a new thistle or dandelion, and the other ninety and nine can be eaten by the birds. And all over the earth plants and trees are thus making seeds each year and setting the table for the birds.

So you see that the birds find their table set everywhere—in the air, in the water, in the earth, in the wood of the trees, and in the seeds of the weeds. All the birds have to do is to secure the food thus spread for them.

*Behold the fowls of the air: for they sow not, neither do they reap; yet your heavenly Father feedeth them.*

Doubt not, so long as earth has bread,  
Thou first and foremost shalt be fed;  
The Providence that is most large  
Takes hearts like thine in special charge.  
Helps who for their own need are strong,  
And the sky doats on cheerful song.

—Emerson, *The Titmouse*.

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Besides the books on birds previously mentioned there are chapters especially on the food of birds in Brehm's "Bird-Life," and Michalet's "The Bird."

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what the birds do. Try to train the observation and the feelings rather than the memory or the critical faculties. For the older children, emphasize the thought of Emerson's poem, that the birds are fed because they deserve to be fed.

*Sources of the Illustration:* The picture on the first page is "The Welcome Guest," by K. Kratschmer, who has painted several fine child-pictures. No. 48 is from Delon, "Cent Recits;" No. 49 is from Wood's "Natural History," Vol. I.; No. 50 is from Figuier's

"Oiseau;" No. 51 is from Brehm's "Tierleben;" and No. 52 is from Martin's "Naturgeschichte."

*Outline of the Course for the Year:* It will be seen by the outline given before that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### III.

#### SETTING THE TABLE.

##### Part II.—Monkeys to Spiders.



#### A TOAD AT DINNER.

I do not think that this little girl ever saw a toad at dinner before, she appears so surprised and interested. And her friends seem surprised, too. The kitty looks as if she thought it was hardly a safe place to be in, and I fear she would run if the toad should hop. But the dog is not afraid. He is ready to spring at the toad if that strange creature should offer to harm his dear little mistress. And I suppose that the toad is surprised, too, to have three such unexpected visitors at dinner, for he seems to have puffed himself up, as toads do when they are startled at anything.

But where is his dinner? Can you see it? It is that fly on the ground two or three inches in front of him. But how is such a slow, clumsy creature as a toad to catch such a lively thing as a fly? If you watch him carefully till he recovers from his fright, you will see how he does it. He

fixes both of his eyes upon the fly as it moves toward him, and the moment it gets within a couple inches of his head, he opens his mouth suddenly and darts out a long tongue that sticks the fly on the end of it and thrusts it down his throat; and then he shuts his mouth again. He does it all so quickly that you can hardly see his tongue at all. It looks as if he just opened his mouth and the fly flew in of his own accord.

That is the way Mr. Toad eats his dinner. He finds the garden full of insects—beetles, ants, moths, caterpillars, spiders and everything else—and he thinks that they have all been made for him to eat. I dare say he imagines the garden to be a sort of table set for him especially. And so he digs himself a little home under one of the flat stones you see in the picture, in a dark corner of the garden, and sits dozing quietly all day long. But with evening he comes out to dine. He moves slowly along from one part of the garden



to another, often stopping motionless quite a while and opening his large mouth and snapping up an ant and a beetle and a moth, and a lot of other insects as they happen to come within reach of his long and lively tongue. But as soon as it grows light, he goes back to his room under the stone and takes a good long nap and digests his dinner and gets ready for another the next night.

And so he goes on from spring till fall; but when the cold weather comes and all the insects are gone, he takes a nap that lasts night and day right through the winter, till another spring comes with more insects. Then he wakes up again and begins to dine on the insects once more. I fear the insects would eat our gardens all up if it were not for the toads. We do not see them very often because they do not generally come out by day, unless it is in rainy or cloudy weather. Their eyes do not look very sharp, but they can see in the night to catch even the smallest and most inconspicuous insects. But when the toad loses one of his eyes he can no longer see to hit the insects with his tongue.

There was a toad once that had his home under a doorstep for thirty-six years, and the people who lived in the house treated him so gently that he became tame enough even to come into the house at night and sit on the table and catch the insects that were attracted by the lamp. But the people had also a tame raven, and this bird was jealous of the toad, apparently thinking that the people liked him more than they did her; and she used to peck at him with her sharp bill, and at length put out one of the eyes of this poor old toad. After that, the toad could not often hit the insects with his tongue, and so he gradually starved to death. For a toad will not eat any insects that you have caught and killed for him. And another thing a toad will not do is to quarrel with another toad over their food. Perhaps they think they have enough for all.

### FISH AT DINNER.

The fish also sit down to this table of flying insects, which we have seen set for the birds and the reptiles. Of course when an insect falls into the water, the fish can get it without much trouble. Or they can even jump out of the water a little distance and catch them, as we often see them doing. You know that the fisherman uses an artificial fly—something made to look like a fly—to catch the fish with. He makes it skim over the water, and the fish down under the water

think it is a real, live fly, and spring up and snap at it and so get caught on the hook.

But there are fish in the Old World which can actually squirt water from their mouths at the flies on reeds or rushes beyond their reach and so sweep them into the water, as you see one doing in the picture of the Archer-fish. A European who was in Java, and heard that the fish shot the flies in this way, got several of the fish and kept them in a vessel where he could watch them, and then he fastened a fly to a stick and put it over the water. As soon as one of the fish saw the fly he came



53. THE ARCHER-FISH SHOOTING A FLY.

steadily towards it till he was within a short distance of it. Then he lifted his head a little from the water and sent a stream flying right up to the insect and hit it, but did not bring it down because it was fastened. The fish seemed much surprised that the fly did not fall, but he swam around the vessel and came up to it again and tried once more. And soon the other fish in the vessel saw it and came up to it in the same way and tried to sweep it down with a stream of water. And finally there was a procession of fish swimming around the vessel and stopping just long enough to take a shot at the fly.

But if the fish had to wait till they could bring down flies in this way before getting their dinner, I am afraid most of them would go

hungry and many starve to death. But they do not have to trust to this food alone. They find the water itself full of food. You see in the picture one of them—a great big fish four or five feet long with a great big mouth—trying to catch one of the little fish and eat it. The big fish is called the Angler-fish, because he has that curious sort of a fish-pole and fish-line sticking



54 THE ANGLER-FISH ANGLING.

out from his head. He covers himself up in the mud or sand, leaving only that fishing tackle projecting into the water. Then he waives it back and forth so that the little tag at the end looks like some little living thing, and when a small fish comes prying about and tries to taste it, the big fish feels it and suddenly opens his mouth and swallows the poor little fish.

There are a great many other big fish who eat the little fish. Indeed, it seems as if that was what so many little fish were born for, since the whole ocean would be packed solid with fish in a very short time if all the little ones lived and grew up, just as the whole earth would be filled full of plants in a little while, if all the seeds grew into plants.

### THE SPIDERS' TABLE.

How does the spider get her share of the insects that seem to feed so many of her fellow creatures? She has no wings, so that she cannot fly, and she has no fins, so that she cannot swim, nor has she a long tongue like the toad to catch her food with. How does she manage to get it? She does just as men do who wish to catch the fish in the sea. The fishermen take cords and tie them by knots into a large net and hang it between stakes in the water, so that the fish, as

they swim along, will get caught in it and furnish food for us.

So the spider spins cord and makes a net, and sets it to catch the flies for food. You have seen many of those nets, like the one in the picture, but perhaps you never saw the spider making it. She usually picks out some place where she can have a post or tree or doorway to fasten one side of it to. She cannot drive posts in the ground as men do in the water to hold their nets, so she has to take what she can find. When she has found the best place, like the corner of a window-frame, she fastens a line to one side of the frame and then goes down to the window-sill and up to the other side of the frame and pulls the line up tight. Then she goes across on it till she reaches the place where she wishes the centre of her net to be. Here she fastens one new line after another, just like the spokes of a wheel, and joins these spokes by some cross-lines like the tire of a wheel. These cross-lines are very sticky and as elastic as a rubber band, so that when a fly comes sailing along and strikes one of the webs he is caught fast.

The spider sits in a little nest in the corner of the window frame or some other secure place, holding fast to a cord stretched from the centre of her net, and the moment she feels the fly struggle she rushes down to the centre, as you see her in the picture, and seizes the lines of the web and pulls, something as a fisherman does when he has



a bite. She can tell by the feeling which of the lines the fly is on, and she runs right down to him; and if he is a large one, she spins some more cord and winds it about him, so that he shall not get away. When she has him caught fast she carries him up to her nest for dinner, and then fixes her net up to catch another for supper. So you see she has to work just as hard as any of the others to get her daily bread.



## Who Stole the Bird's Nest?

"To-whit! to-whit! to-whee!  
Will you not listen to me?  
Who stole the four eggs I laid,  
And the nice nest I made?"

"Not I," said the cow, "Moo-oo!  
Such a thing I'd never do.  
I gave you a wisp of hay,  
But didn't take your nest away."

"Not I," said the dog, "Bow, wow!  
I wouldn't be so mean, I vow!  
I gave hairs the nest to make,  
But the nest I did not take."

"Not I," said the sheep: "Oh no!  
I wouldn't treat a poor bird so:  
I gave wool the nest to line,  
But the nest was none of mine.  
Baa! baa!" said the sheep: "Oh no!  
I wouldn't treat a poor bird so."

"Cluck! cluck!" said the hen;  
"Don't ask me again.  
Why, I haven't a chick  
That would do such a trick.  
We each gave her a feather.  
And she wove them together:  
I'd scorn to intrude  
On her and her brood."

*Lydia Maria Child.*



56. MONKEYS TRYING TO DINE.

## MONKEYS AND WEAVER BIRDS.

Once upon a time there were two young monkeys. They were the brothers of the little monkeys you see on the hand-organs, and they lived in Africa; and one day they went out in the forest to get something to eat. They saw some birds' nests on a tree, and as they liked eggs very much, they thought they would get a few to eat. But the nests hung on slender branches out over the water, and as soon as the monkey tried to climb out to them, the birds all came flying at them and struck them with their sharp bills, till they tumbled one of the monkeys into the river.

## SUGGESTIONS TO TEACHERS.

*For Preparation:* The works on Natural History already mentioned have much about the food of animals, but besides these, help can be found in T. Wood's "Nature and Her Servants," J. G. Wood's "Our Garden Friends and Foes," and S. Wood's "Dwellers in Our Gardens."

*In the Class Room:* Put the picture into the hands of the children and get them to describe them. Ask them what our duties are towards the creatures that serve us; and whether we also earn our food. Let them learn and explain Emerson's lines.

*Sources of the Illustrations:* The half-tone is "Friends or Foes?" by C. Burton Barber. No. 54 is from Brehm's Tierleben. No. 55, from Figuier's "Poisons, Reptiles, Oiseaux." No. 56, from a "Natural History," by the Society for Promoting Christian Knowledge, and the picture on the last page is from Wood's

You can see his head just above the water, and the other one looks as if he would get a ducking, too. I suppose the monkeys thought that birds' eggs were intended for them to eat, but the birds themselves, evidently did not think so. What do you think about it? Were hens' eggs intended for us to eat? And how do we manage to get them for our breakfasts? Why don't the monkeys keep birds and feed and shelter them, and so have all the eggs they want?

*In the sweat of thy face shall thou eat bread.*

He that feeds men, serveth few;  
He serves all who dares be true.—Emerson.

"Homes Without Hands."

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*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### III.

#### SETTING THE TABLE.

##### Part III.—Insects.



#### DINING ON PLANTS.

How interested they are in that gauze net! They have just caught a butterfly in it, and now they are going to hold her in their hands and have a look at her graceful wings and beautiful colors. But how frightened the poor little butterfly must feel to find herself caught in such a trap as that! And how rough the boys' hands must seem to the tender creature! You can imagine how you would feel if some great giant should suddenly swoop you up in a net as big as a room. I think you would struggle to escape, as the poor butterfly does. And what do you suppose she was doing when that little boy saw her hovering above a flower and flung his net over her? She was just going to dinner; for the flowers are the dinner-tables for the butterflies. They do not eat the pretty petals, but they sip the honey that is formed in the flower. You have often sucked the honey in the petals of the clover or in the tips of the red

columbine, I am sure, and you know how nice it tastes. Almost all of the flowers have just such sweet syrup as that down deep in the petals, and it seems just as if this sweet juice was intended to be the food of insects like the butterflies.

The flowers are like so many dishes of honey set all over the earth to feed the insects, and I dare say that the insects think that the whole earth is one great table with the blossoms for plates; and so they go flitting about from one plate to another, helping themselves to the sweet food provided for them. And if you want to see how beautiful the colors of the butterflies are and how daintily they sip their food, and how gracefully they fan their wings, the best way is not to catch them in a net, but to stand quietly beside a bed of flowers in summer and watch them as they come and go. Or you might find some chrysalids hanging on trees or walls and put them in a box with a glass top, and in the spring each chrysalid



would wake up, some of them into moths and some into butterflies, and you could see them stretch their new wings. And if you put a flower into the box you could see the little creature sip the honey from down deep in the petals.

And how do you suppose the butterfly gets at the honey? She does not pull out the petals to



58. THE EMATHION BUTTERFLY.

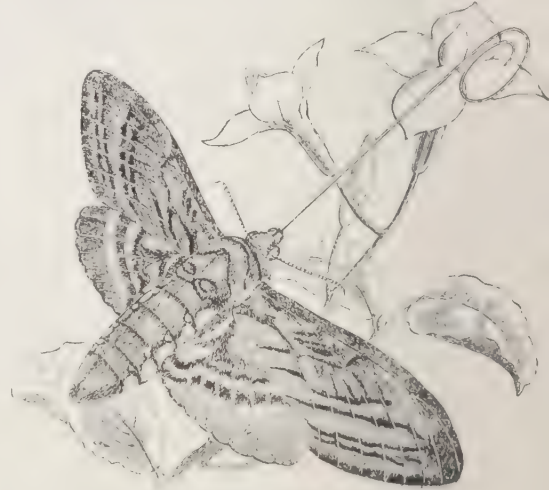
suck it, as you or I would do, nor does she tip the flower to turn it out, for it would not run out if she did; nor does she creep down into the flower. But she sucks it out through a sort of long tongue that she has, which you see coiled up under the head of the butterfly in the picture. When she comes to a flower she straightens this tongue out and thrusts it down into the bottom of each petal and sucks up the sweet liquid, just as you can suck up water through a dandelion stem or a straw. I remember in my boyhood that the first time I saw a cider mill the cider was running into a great tub, so big that we boys could not tip it to get the cider. Nor were there any dippers to dip it up. But the mill was in a barn and there were plenty of straws stacked up in the mow, and we were soon sitting around the tub, each with a straw in his mouth, sucking up the sweet cider. And that is the way the butterfly sucks up her sweet food, only her straw grows out of her mouth and she can roll it up out of sight as soon as she has finished one flower and wishes to go to another.

In the picture of the moth you can see the long tongue uncoiled. The moth is just going to thrust it into the flower. It does not need to be so long for that particular blossom, but some of the blossoms have very deep cups, like the morning-glory, or long spurs, like the honey-suckle, so that the

honey would be quite out of the reach of an insect with a shorter tongue. You do not see the moths so often as you do the butterflies, because they nearly all fly only by night. But if you look under a street lamp in the morning you will almost always find some that have killed themselves by flying against it the night before, and you can see their beautiful colors and can uncoil their long tongue by using the point of a pin. But the best way to see them is to find some of their cocoons and put them in a glass-covered box and then watch them open. Sometimes you can see them eat by putting a dish of sweetened water in the box, but most of them prefer flowers and will feed on them only at night.

There is one kind of moth, however, which cannot eat at all, and that is the great polyphemus moth which has on its wings beautiful spots like the eyes of peacock-feathers. The first time I tried to feed a moth, it happened to be one of these, a Mrs. Polyphemus who had flown into my room, and I was much troubled because she would not eat, though she laid a hundred eggs or more in the box where I put her. But I found out afterwards that she never eats after she has become a moth. She finishes her dinner while she is a caterpillar eating leaves, and puts on her wings not to get food but only to provide for her little ones. But I believe that all of the other mothers eat when they find what they like.

The bees also, as well as the butterflies and



59. THE SPHINX MOTH.

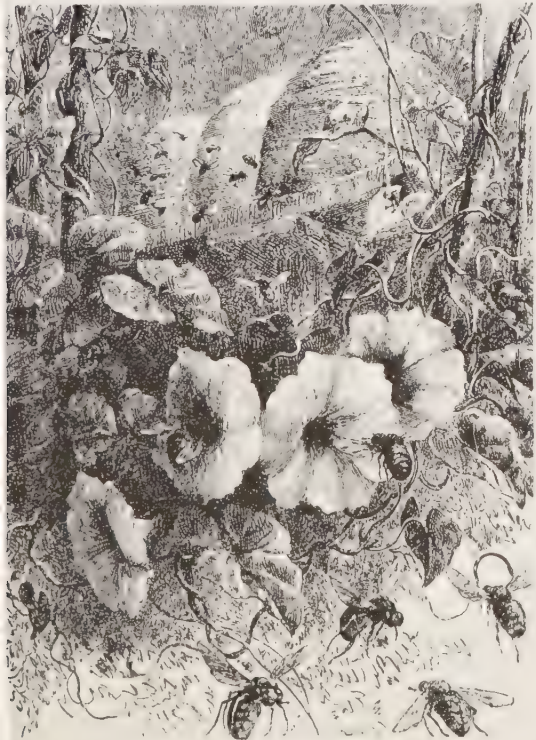
moths, get their food from the flowers, and they, too, have a long tongue to suck up the sweet liquid, as you see from the picture of the Brazilian bees at dinner. With such tongues they can reach down very deep in the flowers. Our own hive-bees, which you see in the picture, do not



60. BRAZILIAN BEES AT DINNER.

have their tongues quite so long, and, therefore, they have to push their heads into the flower, as you see in the picture. When you stand beside the flower-bed in summer to watch for butterflies you will see a dozen bees to one butterfly, and the bees will all seem to be in a great hurry, compared with the butterflies.

This is not because they are so much more hungry than the butterflies, but because they have baby-sisters at home to feed while the butterfly



61. HIVE-BEES AT DINNER.

has no one but herself to satisfy. The bees carry their honey to the hive and give it to the nurses, who mix it with bee-bread and give it to the tiny baby-bees, something as the ant-nurses give food to the baby-ants. There are hundreds of these baby-bees in every hive and they are all hungry and need to be fed often. So their sisters who get food from the flowers for them must wake up early and work hard all day long, as hard as your father and mother do to get food for the children at home.

But insects can suck their food out of the green stalk of a plant as well as out of the flower. You



62. ANT AND APHIDES AT DINNER.

must have often noticed on the plants in flower-pots little green aphides, or plant-lice, as they are called. You can see a lot of them clustered on the stalk in the picture. They are pictured four or five times larger than they really are, so that you can see them better. Each one has a sharp little bill—as you see in the lower one—that will pierce the tender bark of the young shoot as a mosquito's bill pierces our skin. And they can suck the sap out of the tree just as the butterfly sucks honey out of the petals. And each one of them has two little tubes sticking out of the back of its body, as you can see in the cut, and out of those tubes they can send tiny drops of honey for their babies to eat.

But the ants have found out that these little



creatures give honey, and so you can almost always find some ants running about among these aphides when they are on plants out of doors. And if you watch them carefully you will see the ant touch the tubes with its feelers, as in the picture, and then a tiny drop will come out of the tubes and the ant will eat it—for ants are very fond of sweet things. Men who have studied ants call these aphides the cows of the ants, because they get honey from them as we get milk from our cows. The wasps like honey also, and they try to get it from these aphides; but the ants drive away the wasps whenever they find them milking these little cows, and they will even build a covered roof of clay over them to keep the wasps away, something as men will build a barn for their cows.

Of course the ants carry this honey down to the baby-ants in the ant-hill. But they have still another way of getting honey for their little nurslings. They make tunnels in the ground where the roots of plants grow, and take these aphides down under the earth and put them on the roots and let them suck the juice and make their honey there where the wasps cannot get at them and where their little ones can be fed still better. The

ants seem to think that the aphides were intended to furnish honey for them and their babies. I wonder what the aphides think about it. What do you think about it? Were the cows intended to furnish us with milk and the bees with honey?

### THE BEE AND THE FLOWER.

The bee buzzed up in the heat,  
 "I am faint for your honey, my sweet."  
 The flower said: "Take it, my dear,  
 For now is the spring of the year;  
 So come, come!"  
 "Hum!"  
 And the bee buzzed down from the heat.

And the bee buzzed up in the cold,  
 When the flower was withered and old;  
 "Have you still any honey, my sweet?"  
 She said, "It's the fall of the year,  
 But come, come!"  
 "Hum!"  
 And the bee buzzed off in the cold.

—Tennyson.

*Thou preparest a table before me in the presence of mine enemies.*

Nature ever faithful is  
 To such as trust her faithfulness.

—Emerson.

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Besides the books on insects previously mentioned Mrs. Ballard's "Butterflies and Moths" will be useful, especially in telling how the perfect insect can be obtained from the cocoons. Miss Buckley's "Fairyland of Science" has a chapter on bees and flowers. Mr. Scudder is the authority on American Butterflies. His "Butterflies; Their Structure, Etc.," and his "The Life of a Butterfly" will be helpful.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read. Make it more concrete by bringing in, if possible, a mounted butterfly or moth, and a flower with a long calyx. A plant with aphides might be used also. In teaching these lessons the children will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*Sources of the Illustrations:* The half-tone is "Butterfly Hunters," by F. Dvořak; Nos. 58, 59 and 60 are from Wood's "Insects Abroad;" No. 61 is from Delon's "Cent Recits;" No. 62 is from Figuiet's "The Insect World."

*Outline of the Course for the Year:* It will be seen by the outline given before that there are ten different topics during the year,—one for each month,—and

four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, "Setting the Table" through the third, "Clothing the Family" through the fourth, "Learning to Walk" through the fifth, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

### MOTHER NATURE'S CHILDREN.

- I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.
- II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Insects; 8. Fish.
- III. *Setting the Table.* 9. Birds; 10. Monkeys to Spiders; 11. Insects; 12. Plants.
- IV. *Clothing the Family.* 13. Men; 14. Caterpillars and Crawfish; 15. Nautilus; 16. Tortoise.
- V. *Learning to Walk.* 17. Men and Quadrupeds; 18. Insects; 19. Centipedes; 20. Snakes and Worms.
- VI. *Getting Wings.* 21. Bats and Squirrels; 22. Birds; 23. Butterflies; 24. Seeds.
- VII. *Helping each other.* 25. Men; 26. Beavers; 27. Termites; 28. Flowers.
- VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.
- IX. *Borrowing and Lending.* 33. Men from Animals and Plants; 34. Animals and Insects from Plants; 35. Plants from Earth; 36. Earth from Sun.
- X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### III.

#### SETTING THE TABLE.

##### Part IV.—Plants.



#### DINING ON THE EARTH.

"The Favored One" is what the painter of this picture calls it. I suppose that he means that the little girl in the center is "the favored one," because she alone is drinking some of the milk, though the two cats evidently want a drink of it. You can see one of them looking so eagerly and longingly at the milk, and the other is coaxing for it by rubbing her head against the feet of the milk-maid. And there are the two calves, too, that seem to be wondering why they have to wear sharp points of cruel iron on their noses to prevent them from getting any of their own mother's milk, while the little girl can have all she wants. And the kind old cow-mother herself looks a little disappointed over it.

But I think you know why the little girl is allowed to drink first. If the cats were always permitted to get all they wanted first there would not be anything left for the boys and girls, and boys and girls are much more help to the world than cats are. And if the calves were allowed to get all the milk they wanted there would not be any left for

us. So we have to keep the calves away from their mother in some kind manner, and give only a part of her milk to them. In that way we get enough for them and us both and enough to make butter also.

But where does the cow herself get the milk she gives to us? She stays all day in the pasture, which you see in the picture, and eats nothing but grass and drinks nothing but water. Yet she has a whole pailful of milk at night and almost as much more again in the morning. Evidently the milk must somehow come from the water and the grass. Neither the water nor the grass seem to contain any milk, yet the materials out of which the milk is made are really there in the water and the juice of the blades and stems of the grass. You remember that the corn-mother made "milk" for her baby-seeds, and we saw the milk "condensed" in the kernels of corn. The white flour also that we eat in our bread is the condensed milk which the wheat-mother formed for her baby wheat seeds. And there is a tree in South America called the cow-tree, because when



you cut into it a stream of white liquid runs out that looks like milk and tastes like it, and contains practically the same elements milk does. You can see some people tapping such a tree in the picture.

Perhaps some of you have seen people tapping trees here in our own country. When I was a boy in New England I used to enjoy going in the spring to a sugar-berth, as it was called. It was a grove of maple trees which had been tapped by boring holes in the trunk of the trees and putting round tubes into the holes. A sweet sap would run out of the hole and drop into the pail set under the tube, as you see it doing in the picture, and out of that sap maple syrup and maple sugar were made. So you see the farmers milk their maple trees as well as their cows, and they get a good many pailfuls of maple milk, as it were, from each tree.

But where do the maple trees get the sap and the cow-trees the milk they pour forth so generously? And where does the grass get the juice it gives the cows that they may change it into milk? Where is their table set to furnish them with food? If you should pull up a bunch of grass you would find a lot of fine, white, thread-like roots running down into the ground. So, too, if you could pull up a maple tree, or any other tree, you would find that the big roots send out at their sides or tips these same fine, thread-like shoots. Of course you cannot pull up a big maple tree,

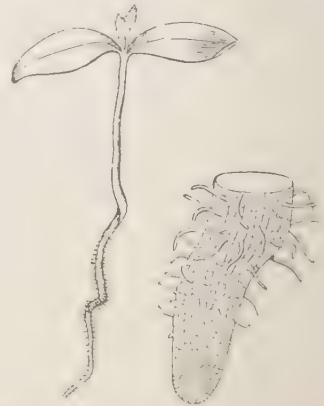


65. MILKING THE MAPLE-TREE.

but you can pull up a baby maple, like that in the picture, and you will find its own roots covered with those little white hairs. If you look at the tip of the root with a magnifying glass it would present the appearance of the object at the right of the baby maple; or if you could magnify it still more and see it with all the bits of earth about it, just as it is in the ground before you pulled it up, it would look as you see it in the next picture. You can see there that the hairs are

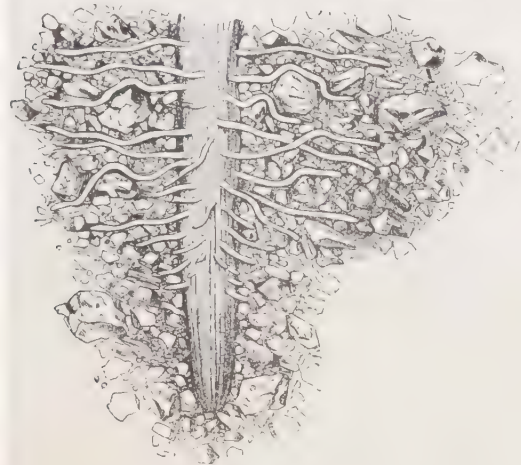


64. MILKING THE COW-TREE.



66. A BABY MAPLE. THE TIP MAGNIFIED.

little tongues thrust out into the earth between the bits of sand to suck up food, something as the long tongues of butterflies and moths are thrust into the flowers to suck up the sweet juices the plants make. The plants do not eat the earth



67. TIP OF ROOT MAGNIFIED MORE.

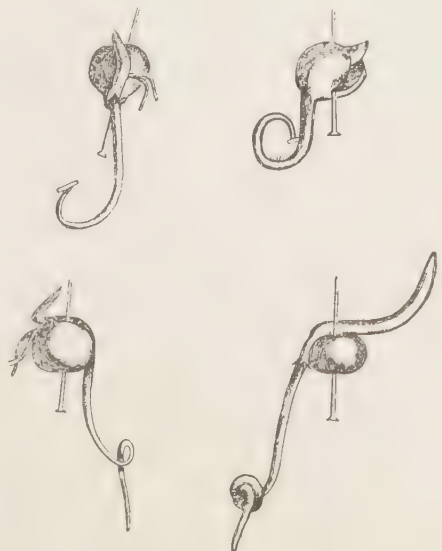
any more than the moths and butterflies eat the flowers. The roots only send out their long slender tongues and lick up all the juices they can find in the earth.

And how do you suppose these slender rootlets manage to find their way about in the dark earth so as to secure their food and avoid the obstacles in their pathway? You can see from the picture of the root in the earth that one of the little tongues has bent right around a bit of gravel and then gone straight on its way again. Men used to think that the stone pushed the root away, but if that were so it would go growing off in another direction instead of climbing over the stone and creeping on the same way. And Mr. Darwin proved by a very pretty experiment that it was the root that moved itself because it wished to avoid the stone and not because it was pushed away by the stone, for he induced the roots to turn by making them think there was a stone in their path when there was really no obstacle at all in their way. You can see his experiment in the picture of the roots trying to dodge an imaginary stone. He thought that if the roots turned of their own accord because they felt the stone, as we turn to avoid a wall when we feel our way along in the dark, then they would turn without any stone in their way if they felt something that seemed like a stone. So he started some seeds, and when the roots began to grow he pasted a tiny bit of paper on the side of each root-tip. Of course the paper did not offer the slightest resistance to the roots. They could have gone on growing straight ahead if they had only thought so. But the deluded little things thought the touch of paper was the touch of a stone in their path, and so they began to try to get around it. But the paper was stuck to them and as they

turned they took it with them. So they kept on turning and turning, some of them three or four times round, till they knocked the bit of paper off, as you see the two lower ones have done, and then they started straight on again, thinking they had at last got around that big stone they fancied in their way.

They reminded me of a cat I had in my boyhood who brought a mouse into my chamber once and let it loose to show me how well she could catch it. But the mouse ran into one of my congress boots that was lying on the floor and the cat pushed her head in after it. But when she tried to pull her head out the elastic held the shoe fast on her head. So she began to try to back out of it and she backed all the way around the room two or three times, till I came to her help and pulled the boot off. I suppose she thought she could back out of the shoe if she backed far enough, but she could not because she was taking the shoe with her on her head. And so the roots thought they could turn away from the obstacle if they turned long enough, but they couldn't because they were carrying the obstacle with them.

The roots also know how to seek the best supply of food and water, as well as how to avoid obstacles. I have heard of a root that climbed a wall six feet high to reach some water the other side of it, and of another tree that sent roots sixty feet away in one direction because there was a spring of water there, though the roots extended only a few feet in the other direction. And you know how thickly trees grow beside a stream. They seem to gather about the water as the bees



68. BABY ROOTS DODGING IMAGINARY STONES.



and butterflies gather about the flowers. And they gather for the same reason, because they find a table set for them there.

So you see the great earth itself is the table set for the plants, just as the plants are the table for the cattle and the insects. All that the little baby-seed has to do when it has waked up in the spring and eaten the condensed milk its mother prepared for it, is to thrust out its tiny tongues and it will find plenty of food dissolved in the moisture of the earth. Somebody seems to have made their whole globe a great round ball of condensed milk, which the rains melt, so that all the tiny mouths of the millions of plants can suck it in and change it to sap or milk or corn or wheat. But all these plants have to work hard to get this food. They have to push their tender tongues out in all directions, and climb over stones and walls to reach the nourishment. Mother Nature does not pour it down their throats, any more than she pours honey down the throats of bees or butterflies. Those that wake up earliest and work hardest get the most food and outgrow and overshadow the others. Mother Nature sets her table over the whole earth for all her children, but she does not allow any of them to eat without earning their food by working for her. The birds and insects that cradle and tend their little ones are working for her. The plants that feed the cattle, the cattle that eat the grass and change it to milk for us, are all working. But the man or woman or boy or girl that does some kind act or speaks some loving word is doing the noblest work of all, and so is fed with the bread of earth and of heaven most bounteously.

#### SUGGESTIONS TO TEACHERS.

*For Preparation:* Besides the books on plants previously mentioned, Darwin's "Power of Movement in Plants," and Gray's "How Plants Behave," will be helpful. Taylor's "Sagacity and Morality of Plants," will also give suggestions for the whole course. The best recent book on the subject is Kerner's "Natural History of Plants," translated by Oliver and being published in England. The third half-volume is out.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read. Make it more concrete by bringing in, if possible, some little growing plant to show the tiny rootlets to the children. In teaching these lessons the children will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we



THE WOOD-MOUSE.

Do ye know the little Wood-mouse,  
That pretty little thing  
That sits beside the forest leaves,  
Beside the forest spring?

In the hedge-sparrow's nest it sits,  
When summer brood is fled,  
And picks the berries from the bough  
Of the hawthorne overhead.

I wish you could have seen him there;  
It did my spirit good  
To see the small thing God had made  
Thus eating in the wood.

I saw that He regarded them,  
Those creatures weak and small;  
Their table in the wild is spread  
By Him who cares for all.

—Mary Howitt.

*He openeth his hand and satisfieth the desire of every living thing.*

Rocked on her breast, these pines and I  
Alike on Nature's love rely.—Whittier.

can safely leave the reconciliation of those ideas to the later years of the pupil.

*Sources of the Illustrations:* The half-tone is "The Favored One," by T. Lloyd. Nos. 64 and 65 are from Pouchet's "The Universe;" No. 66 is from Gray's Botany; No. 67, from Kerner's "Natural History of Plants;" No. 68, from Darwin's "Power of Movement in Plants;" and No. 69, from Mary Howitt's "Birds and Flowers," illustrated by Giacomelli.

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## Mother Nature's Children.

### IV.

#### CLOTHING THE FAMILY.

##### Part I.—Birds.

##### THE SNOW-BIRD'S SONG.

The ground was all covered with snow one day,  
And two little sisters were busy at play,  
When a snow-bird was sitting close by on a tree,  
And merrily singing his chick-a-dee-dee.

He had not been singing that tune very long  
Ere Emily heard him, so loud was his song:  
"Oh, sister, look out of the window!" said she,  
"Here's a dear little bird singing chick-a-dee-dee."

"Oh, mother, do get him some stockings and shoes,  
And a nice little frock, and a hat if he choose;  
I wish he'd come into the parlor and see  
How warm we would make him, poor chick-a-dee-dee."

"There is One, my dear child, though I cannot tell who,  
Has clothed me already, and warm enough too;  
Good morning!—oh, who are so happy as we?"  
And away he went, singing his chick-a-dee-dee.

—F. C. Woodworth.

##### CLOTHING THE BOYS AND GIRLS.

You can all see what that little girl is doing in the picture. She is playing with one of those dear little kittens, while the other one is eating milk out of the saucer on the ground. But can you see what the mother is doing? It looks as if she were sewing, doesn't it? And if you examine the picture closely I think you will see what it is she is sewing. It is a little jacket. So I suppose she has a little boy somewhere, perhaps at school, and she is making him a coat, or mending it for him. And that sweet little girl has on a dress that her mother has probably made for her. And if you look through the open door at the right of the picture you will see a tiny baby sleeping in a cradle; and I am sure that the baby's dresses were also made by her mother, who loves her too dearly to let anyone else do it for her.

So you see what a busy woman this mother must be, making and mending the clothes for all these little ones, and perhaps as many more bigger ones that we know nothing about. I shouldn't



wonder if she had to sit up at night after the children were abed and asleep to keep them warmly and neatly clothed. But what would she do if she had to make and mend the clothes of all the people in the world, big and little? And what would she do if, besides that, she had to make and mend all the clothing for all the birds and all the cattle and all the fish and all the insects and all the plants? Do you suppose she could manage to do all that? I don't believe she could even if she sat up all night long every night in the year. And yet somebody is making and mending the clothes for all these countless





71. THE PTARMIGAN IN HIS SUMMER SUIT.

hosts of creatures all the time, and giving them new suits of clothes every year, and in some cases two or three times a year. Who do you suppose this good mother is? And how do you suppose she manages to clothe her family?

### CLOTHING THE BIRDS.

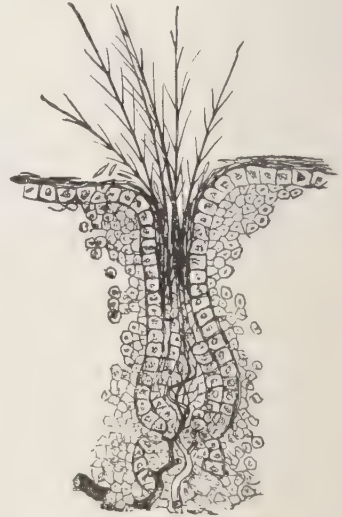
If you should feel of a live bird's body you would find that it felt a great deal warmer than your hand or your face. And it is really warmer than any other living thing. And you know it goes flying through the air, so that a cool breeze is blowing upon it all the time. Therefore it needs very warm clothing to prevent it from getting cold. But it has just the clothing it needs in its feathers. You know how warm feathers are, and you can see from the picture of the Ptarmi-



72. THE PTARMIGAN IN HIS WINTER SUIT.

gan in his summer suit that he seems covered all over with dark colored feathers. And in winter he has a still thicker coat of white feathers to match the white snow, as you will see from the next picture of the same bird in his winter suit. How does he get his clothes? How does he change them with the changing seasons of the year?

Next spring, when the mother hen has her tiny chickens, if you will look at them closely when they are only a day or two old you will find that they do not seem to have feathers like their mother, but appear covered over with soft down more like hair than feathers. That soft down is their baby-clothes and they get it before they leave their shells, so that they are born with their baby-clothes on. It grows out of their skin, just as our finger-nails grow out of our skin at the end of our fingers. In the picture of the feather



73. A FEATHER GROWING.

growing you see it coming up through the cells of the skin something as the blades of grass come up through the grains of sand. The soft downy points that are to form the sides of the feather come up first, as you see in the picture, and the feathers appear later. In the next picture of the wing of the bird you can see the feathers full-grown. You will notice how far the quills extend down into the skin, something as the stalk of some plants extend down into the earth. And when a bird, like the Ptarmigan, changes its summer clothes for a thicker winter suit, the new feathers grow up right in the same place where the old ones are and push them out, so that they fall off and you find them on the ground sometimes. That change of dress is what is called



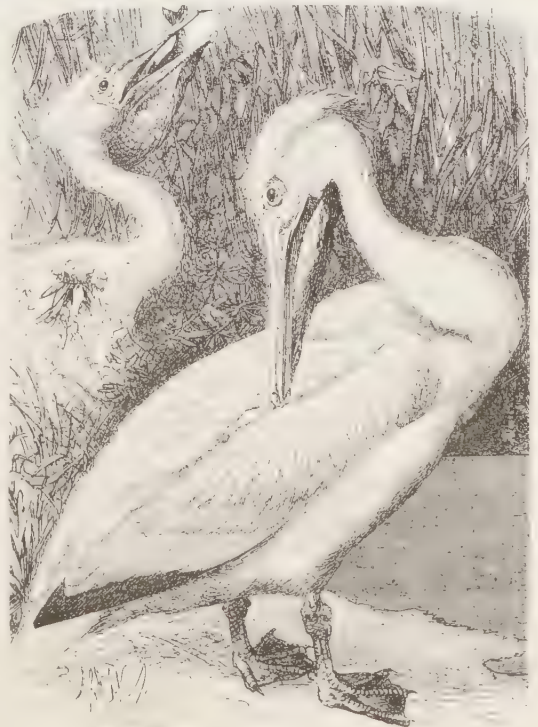
74. A BIRD'S WING.

“molting,” and it takes place so rapidly that in a few weeks a bird will change all its feathers and have a new suit, though the old feathers do not all come out at once, because the poor bird would be like to freeze to death if they did.

So you see how the birds get their clothing. The bird-mothers do not have to sit up nights making and mending the clothes of their little ones, because the clothing grows out of the skin of the birds, as the plants grow out of the earth. But the plants grow from seeds in the ground; and who do you suppose sowed the seeds for the feathers, and waked them up and taught them how to grow? Whoever it is that does it must be very, very busy, for you know what countless numbers of birds there are, all having new suits of clothes every year to take the place of the old suits that get worn and torn. And there are all the dear little baby birds too, each spring, that must have soft, downy baby-clothes made for them before they are born.

But though the birds have their clothing grow for them, yet they are compelled to take care of it for themselves. If you have ever watched a canary bird, you must have noticed how often they have to fix their feathers,—“preen” them, as it is

called,—by smoothing them out with the bill. Birds have to comb their feathers more carefully than you do your hair. For if you neglected your hair so that it got matted, I suppose you would not die, though you would not feel so comfortable, nor look so well as you do now. But if a bird should neglect his feathers and allow them to become tangled and wet and dirty, he would probably die in a very short time, because his clothes would not keep him warm any longer. For the feathers are warm because they are not packed close together but are loose and have spaces filled with air between them. By raising the feathers and making those spaces larger the feathers become still warmer. If you notice a canary bird when he is asleep you will see that his body seems much larger than when he is awake. That is because he erects the feathers and so makes them warmer when he goes to bed, as we put on more clothes at night, and tucks his head under the bed-clothes, too. And in winter you will notice that the sparrows seem puffed out larger, and they have really put on a thicker coat by raising their feathers. But the birds could not do this unless they kept their feathers clean. So they have to be constantly washing them and brushing them and laying them down straight, because they cannot take them off and wash them and iron them once a week.



75. PELICAN FIXING HIS CLOTHES





76. THE CRESTED GREBE KEEPING HER BABIES' FEATHERS DRY.

And when a bird goes into the water, as so many birds do, he has to be still more careful of his clothes or he will get them wet through and so die of cold. All water-birds have an oil can, or oil-gland, as it is called, located down among the tail feathers. And when the bird has smoothed out his feathers, he reaches his head down to the oil-gland and gets a nip of oil in his bill and oils the feathers, so that the water will have hard work to get into them. It makes a sort of oil-cloth of the feathers, so that the water runs off a

duck's back instead of soaking in and wetting the duck. In the picture of the pelicans you see one of them oiling his feathers with his bill. He has been fishing for his dinner and had to dive into the water to catch the fish, but as soon as he has come out on the shore he begins to arrange his feathers. It takes him about all the time to get his meals and fix his feathers.

The baby birds cannot manage their feathers so well as their mother can, and so the mother sometimes carries the little ones on her back when they get tired and wet, as you see the crested grebe doing in the picture. And the land birds, like our domestic fowls, have so little oil on their feathers that they would get wet through very quickly, and so they do not like to go into the water. I remember reading once of a swan that carried a hen on her back, as the grebe carries her little ones. The swan and the hen had each hatched out some little ducklings at the same time, and the two broods used to go around together, the hen scratching for them on land and the swan looking after them when they took to water. But the hen seemed very anxious when the ducklings were on the water, and so one day the swan came swimming up to the shore and took the hen upon her back and carried her out among the little brood so that she could watch over them without wetting her feathers.

*He shall cover thee with his feathers.—Ps. 91, 4.*

This scrap of valor just for play  
Fronts the north-wind in waistcoat gray.

—Emerson: *The Tiltmouse.*

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Besides the books on birds previously mentioned, Coues's "Key to North American Birds" has a good account of the growth of feathers. In the *Encyclopædia Britannica* under "Skeleton" the comparative anatomy of feathers, hairs, etc. is explained, and in other encyclopædias under "Hair" and "Feathers." Orton's "Comparative Zoology" treats of it, and Buckley's "Winners in Life's Race" describes the origin of feathers and wings.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read. Make it more concrete by bringing in, if possible, a large feather and a small one to show their structure to the children. In teaching these lessons the children will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*Sources of the Illustrations:* The half-tone is "Happy

as the Day is Long," by Thomas Faed, who has painted several other beautiful pictures for children. No. 71 is from Figuier, "Oiseaux;" No. 72 from Brehm, "Fuglenes Liv," as is also No. 76; No. 74 is from Jones' "Book of Birds," Vol. I; and No. 75 from Brehm's "Thierleben."

### MOTHER NATURE'S CHILDREN.

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## Mother Nature's Children.

### IV.

#### CLOTHING THE FAMILY.

##### Part II.—Mammals.



#### CLOTHING THE SHEEP.

Why do you suppose the shepherdess is carrying that lamb in her arms? Perhaps the poor little thing was cold and so chilled that it could not walk. The baby lambs are born so early in the spring sometimes that they have to be wrapped up in a blanket to keep them warm because their baby clothes are not so thick as their mother's clothes, as you can see from the picture. And where do you think they get such nice warm clothing? Who do you imagine makes it for them? It is made by the same good Mother that makes the birds' clothing. And you remember that the birds' clothes, instead of being cut out of cloth and sewed together and put onto the birds from the outside, were made to grow out of the

bird's skin in the shape of feathers, something as our nails grow out of the ends of our fingers. And the sheep's clothing grows in the same way out of the skin of the sheep, just as hair grows out of your head. And just as each hair of your head has little oil-glands to keep it moist, so that the water cannot easily soak in to wet your head, in the same way each hair of the sheep's wool has oil-glands to make a sort of oil-cloth of the fleece so that the rain may run off without wetting the sheep or the lamb. So they do not have to oil each separate hair as the bird does each feather.

The sheep, too, have thicker clothes for winter and thinner for summer, just as well as the birds do. For the wool of the sheep falls off every



spring, or would fall off if it were not cut off by the shepherds, and a new growth starts, and by winter it is long enough to keep them warm. And then in the spring it falls off again. And so it does every year, giving them a thick coat in the winter and a thin one in the summer. The wild sheep of the Rocky Mountains, who do not have anyone to shear them, have an overcoat of long hair grow in the fall and drop off in the spring, while their undercoat of short hair stays in the summer as well as the winter. If you will smooth your kitty's back the wrong way you will see the same two coats she has on, one of longer, coarser hairs and the other of finer, shorter hairs. And you must have often seen her cleaning her fur by licking it with her tongue. She has to work very hard to keep it clean, because it is not so well provided with oil as the sheep's wool is, and would easily get wet and dirty and so be cold and unhealthy. And when the cat has little kittens you will see her clean them in the same careful way before they are large enough to take care of themselves. She has to do all the family washing for herself and all her children, and has to do it with her tongue, and yet she keeps herself and her family very clean indeed.

#### CLOTHING THE BEAR.

In this picture you see the white bear mother and her two babies. They are lying down deep under the snow. On the surface of the snow you can see the dogs and men hunting for the bear,



78. THE WHITE BEAR IN HER WINTER CLOTHES.

but they will hardly find her because she is buried so deep in the snow. You remember how she lies down under some cliff and lets the snow fall on her and cover her and her babies up till they are wholly out of sight. But she would freeze to death if she did not have such long, thick fur to keep her warm. That is her blanket and quilt, and she cosies her little ones up to her breast so that they do not feel the cold and the snow, though they, too, have their baby-clothes of fur when they are born.

#### CLOTHING THE MAMMOTH.

I think most of you have seen an elephant and I dare say you think it would take a pretty large suit of clothes to cover him. And he looks



79. THE MAMMOTH IN WINTER CLOTHES.

as if he had nothing on his skin to keep him warm; but he lives in a country so hot that I presume he does not need any clothes. But his ancestors—his great, great grandfathers,—used to live on the earth during what is called the Great Ice Age, when most of the land where we live was covered with vast fields of ice ever so thick. These animals were called mammoths, and though they were much larger than the elephant is now they had clothing to cover them; for a coat of brown hair nearly a foot long grew all over their bodies, and they had a shaggy main about their head and neck. You can see one of them in the picture of the mammoth, and you can make out the great glaciers or ice-fields in the back of the picture, while in the right hand part of it there are three seals that also wear fur clothes,—seal-

skin coats,—which not only keep them warm, but also keeps them dry when they swim in the water, as they do a great deal of the time. So you see the great Mother kept her children well clothed even in the Ice Age; but when the ice-fields melted away and it grew hot again she took off their heavy coats, so that you will find only a few coarse hairs on the elephants of to-day.

#### CLOTHING THE MONKEYS.

The mother-monkey in this picture does not have to make her baby any clothes, for they grow on him just as her clothes grow on her, though I think she would provide some way to keep him warm even if he was not provided with clothes. She carries him in her arms when he is small and she keeps the flies away from him when he is asleep, and when he wakes she takes him down



80. THE WOOLLY MONKEY AND HER CHILD.

to some pool of water and washes his face, like a human mother, and if he doesn't behave himself she boxes his ears, I am sorry to say. You see from the picture that she uses her long tail to hold on to the branch of a tree, but she also uses it as a sort of comforter to wrap around her neck or her baby's neck when it is cold, as it often is at



81. THE PORCUPINE MOTHER AND HER CHILDREN.

night in South America, where these monkeys live.

#### CLOTHING THE PORCUPINE.

Besides keeping her children warm Mother Nature protects them by their clothing when they seem to need protection. The soft hairs grow stiff and sharp as the hairs on the back of a pig. Those pigs' hairs we call bristles, and you can see them in any tooth-brush and you can feel of them and see how strong and sharp they are. But on the porcupine, as you see in the picture, they grow still longer and sharper and stiffer, so that they are like so many sharp needles ready to stick into any one. The porcupine is a slow, weak creature, and she cannot defend herself by running or biting or scratching, so when she perceives anyone coming she gets right in front of her little ones and turns her bristling back toward the enemy; and then she erects her quills so that they stick out in all directions, and if you touch them they seem to fly right out of her skin into your hand and they work their way deep into your flesh, so that sometimes lions and tigers have been found dead with some of these quills sticking into them far enough to kill them. But if you do not try to touch her she will smooth them down and let her little ones come out from behind her and begin to eat, as you see them doing in the picture. She is holding a vegetable with her paws while two of her babies are nibbling it, and another is nursing its mother. The little ones themselves have only soft white quills when they are born, but as they grow older the quills harden and lengthen rapidly, so that in a few weeks the younger ones can defend themselves in the same way that their mother does.



## CLOTHING THE ARMADILLOS.

A still stranger suit of clothes is seen in the next picture. The Six-banded Armadillo, as it is called, has some hair under its body and a few

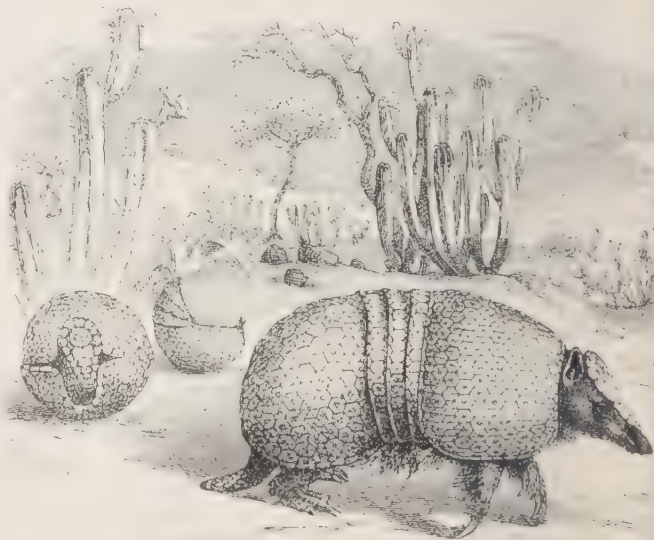


82. THE SIX-BANDED ARMADILLO.

hairs between the scales on its back, but on most of its upper surface you see it has bony scales, covered over with a sort of enamel, something as if we had a lot of finger-nails growing out all over the back of our body. The bony scales grow out of the skin as the feathers and hairs do; but this creature doesn't need hairs to keep him warm, though he does need scales to keep other creatures from eating him up. So his suit of clothes grows out of his skin as a suit of armor. And he uses it to protect himself in several ways. If you come upon him he will at once burrow into the ground with his strong claws, as you see him doing in the picture, and in three minutes he will dig a hole deep enough to squeeze into it and get out of sight; and if you try to pull him out by the tail you will find that you cannot possibly do it, because he erects his scales something as the porcupine does his quills, and sticks their sharp ends right into the earth above his back, while his long sharp claws stick into the earth below him. You may pull his tail off if you pull hard enough, but you cannot move him. Another way he uses the scales to defend himself is by rolling himself up into a ball so that the outside of his body is almost entirely covered with scales.

But his cousin, the Three-banded Armadillo that you see in the next picture, is still better

clothed for turning himself into a round ball. You see that the scales on his shoulders have grown into one solid, bony box, like half of a cocoanut shell, and the scales on his loins have grown into another bony box, like the other half of the shell, and the two halves are joined in the middle of his body by moveable bony rings that open and shut something as the rays of a fan do. When this armadillo goes out walking he opens his two half boxes, as you see him in the picture, and walks slowly along on the tips of his toes. But whenever you come upon him he does not try to dig into the ground as his cousin does, but he shuts up his two half-round boxes into one box completely round, like a cocoanut shell before you cut it open. You see two of these armadillos shut up that way at the back of the picture on the left hand side, and you can



83. THE THREE-BANDED ARMADILLOS.

see in one of them how the scales on the head and tail close up the opening completely, so that even the dogs cannot get at the creature, though they try hard to bite into it. So you see how safely as well as warmly these children of Mother Nature are clothed.

*He hath clothed me with the garments of salvation.*  
—Isaiah 61, 10.

Know, Nature's children all divide her care;  
The fur that warms a monarch warmed a bear.

—Pope.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### IV.

#### CLOTHING THE FAMILY.

##### Part III.—Mollusks.



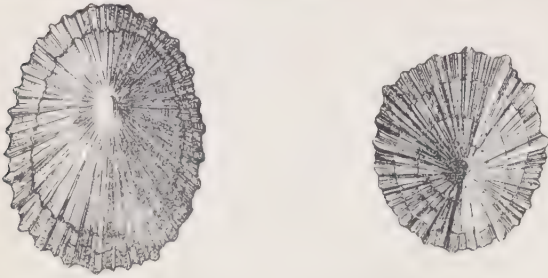
#### SHELLS FOR CLOTHES.

Here is a happy family. The oldest boy has been away to sea and has just returned from his first voyage, and he is so busy telling them about the droll things he saw that he can hardly find time to eat. And you can see how interested they all are in listening to him—his mother, his two brothers and his oldest sister, who has stopped with her ladle in her hand to hear the story. But his other sister, on the other side of the picture, does not seem to be listening to the story. She is holding something up to her ear, just as we hold the receiver of a telephone, when we want to hear the message. What do you think it is that she is listening to in such pleasant surprise? If you look closely you will see the spiral of a shell, one of those beautifully shaped and richly colored sea-shells that people bring home from the other side of the world. I suppose her

brother has brought home that shell and perhaps he has given it to her for her own.

But what do you think a shell really is? It is a suit of clothes that Mother Nature made for a little creature that lived in the sea, or rather, the good mother helped the little Mollusk, as he is called, to make the clothes for himself. He did not start in life with his shell full-grown. When he was a baby he had only a little cap of a shell, as it were, on his upper side; for the people who study him do not believe that he has much head. You can see this little baby shell right at the sharp end of the large shell which the boy's sister is holding to her ear. Some of the mollusks do not change the shape of the shell from this first cap-form. They just make the cap a little larger round, something as if your mother should make you a baby straw-hat, and then as you grew larger you should sew on one braid of straw after





85. THE BLUE LIMPET'S HAT. THE ROSE LIMPET'S HAT.

another. If you should keep sitting on the ground all your life and should make your hat broad-brimmed enough, it would cover you completely up, as the shell of the limpet does him. And he has made it by adding one braid of shell to another, as you can see by looking at the picture. The little baby-shell grows out of the mollusk's back, as the feathers grow out of birds and the hairs out of animals; and as he increases in size he pushes his skin out beyond the edge of the old shell and makes a new rim, and then another, and so on, as long as he continues to grow larger.

But some of the mollusks do not like to sit on the ground holding their hat on all the time, and so they have contrived a differently shaped shell. As they have grown and made their hat larger braid by braid, they have changed it into a sort of basket into which they can get altogether and put the cover on, and so shut themselves out of harm's way. In the picture of the growing snails you can see that the smallest one—the one at the bottom of the picture—has a shell that he can pull himself into and be completely out of sight, though he has only just come out of one of those eggs. When he grows a little larger he looks like the top of the picture on the right hand side, and when he is full grown he looks as you see him in the middle of the picture.

As he grows he adds just enough to keep the shell the right size; and if you look at it sharply, you will see the little rows of matter he



86. A GROWING SNAIL'S GROWING CLOTHES.

has added from day to day. He twists it round as he makes it larger, and so it is possible to use the old baby-shell as a part of the new clothes. He doesn't throw away his baby-clothes, but on the largest shell you can see the first suit in the tiny twist at the centre. When a bird comes along and tries to eat up Mr. Snail, he pulls himself into his hat and is safe; and when winter comes and tries to nip him with its frost, he gets into his clothes and makes an air-tight door, and then goes to sleep for the winter. And in the water, as you see from the picture of the pond snail, he can get about just as well as on land. If any hungry fish comes along, he goes into his shell, and the fish can harm him no more than the bird can his cousin on the land, though he gets killed sometimes, as you see from the empty shell on the right.

There is another sort of mollusk that makes a still more convenient suit of clothes for himself.



87. WATER-SNAILS AND THEIR CLOTHES.

He starts in life with a little cap on his back, something as the snail does, but his cap has a little hinge in the middle of it, so that it can be opened and shut like the covers of a tiny book. Perhaps it is more like a coat than a cap—a coat that is stiff on the sides but has a hinge up and down the back. The oyster belongs to this coat-wearing family and the baby oyster has a tiny shell coat that he can open and shut. You can see from the picture of the growing oysters how small they are when they settle down in life. The smallest—those specks at the bottom of the picture on the right—are only a few days old, while the largest at the top are a year old.

Each of the little ones adds a new layer to his



88. GROWING OYSTERS AND THEIR GROWING COATS.

coat as fast as he outgrows it. This layer is added to the inside of the coat and leaves the outside just as it was, so that even on the largest oysters you can see the tiny baby coats they wore at the very first. The baby coat is close to the hinge at the back of the shell, and then next to it comes the second coat that was put on under the first, and then the third, and so on to the last coat of all, that was put on perhaps only a few days ago. It is something as if your father should still keep his baby-coat and all the other coats he ever wore fastened upon the back of the last coat that he bought. That would make a pretty heavy coat, would n't it? And so you find the shell coats of the oysters are heavy, and they are thickest and heaviest close to the hinges, where all of them are kept piled up one inside of another. If you should burn an oyster shell in the fire and then break one side of it into two pieces you would probably see the different layers of the different coats.

In the picture of the clams and mussels you can see some more of the mollusks that wear this two-leaved coat. The one at the bottom of the picture in front is the clam. He has stretched out his one foot on the right and the tubes through which he gets his water on the left. But he can pull in his foot and his tubes so that they will all be inside the shell coat, and he can shut

the two leaves of the coat so tight that you couldn't open them with your fingers, if you tried ever so hard. Perhaps you never saw a live shell open, for these creatures always shut up their coat and button it when they are caught. But if you take one of the mussels that you can find in the rivers and ponds and put it in a pail of water with sand at the bottom and watch it a few hours without touching it you will see it cautiously open its coat and push out its foot and plough a little little path for itself in the surface of the sand.

But the salt-water clams, that you see at the bottom of the picture, do not live on the surface of the sand. They burrow down out of sight and only thrust up their tubes to get fresh water, as you see one of them doing at the right edge of the picture. The other mollusks in the picture do not go on the ground if they can help it. They spin fine threads to fasten themselves to a stick or a stone, and open their coat to get food and drink. You can see the edges of their skin, or "mantle," as it is called, sticking out in a little white line just beyond the edges of the shells, with something that looks like little frills projecting still farther; and in the clams also, you can notice the mantle pushed out beyond the shell. This mantle somehow picks out bits of lime and packs it together into new layers of shells. But the mollusks have to be very busy all the time getting material and making it into shell, if they would have clothes large enough to cover them and stony enough to resist the waves and the hungry creatures on sea and land.

So you see how well-clothed all these creatures are. They do not need feathers or hairs to keep them warm, as the birds and animals do, but they



89. CLAMS AND MUSSELS IN THEIR SHELL CLOTHES.



need for their soft bodies something that the fish and birds cannot easily break, and they have what they need. And the wise little things seem to know enough to make their clothes over and keep them the right size and shape. How do you suppose they learned to do it? Who teaches all the baby clams, and baby oysters, and baby snails to make their clothes hard and stony outside and smooth as pearl inside? Whoever it is that does it, must care a great deal for all the living things in the sea as well as on the land, and must know just what each thing needs and just how to give it what it needs—feathers or hair, to keep it warm, or bony plates or shells to keep it safe. That must be a very wise and a very busy person, must it not?

## I.

See what a lovely shell,  
Small and pure as a pearl,  
Lying close to my foot,  
Frail, but a work divine,  
Made so fairly well  
With delicate spire and whorl,  
How exquisitely minute,  
A miracle of design!

## II.

What is it? a learned man  
Could give it a clumsy name.  
Let him name it who can,  
The beauty would be the same.

## SUGGESTIONS TO TEACHERS.

NOTE.—These suggestions were crowded out of the last number and consequently this number contains the hints for No. 14 as well as for No. 15.

*For Preparation:* Besides the books on animals previously mentioned, in the Encyclopædia Britannica under "Skeleton" the comparative anatomy of hairs, feathers and scales is explained, while under "Fur" and "Wool" further material is to be found. Other encyclopædias treat of the same subject in alphabetical order.

For the shells, Gegenbauer's "Comparative Anatomy" is perhaps the best account of the development, and Buckley's "Life and Her Children" gives the clearest description of the classes. The encyclopædias can be consulted with profit under "Snail," "Clam," "Oyster."

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read. Make it more concrete by bringing in, if possible, some specimens of fur and wool for No. 14, and some shells for No. 15, to show their structure to the children. In teaching these lessons the children will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

## III.

The tiny cell is forlorn,  
Void of the little living will  
That made it stir on the shore.  
Did he stand at the diamond door  
Of his house in a rainbow frill?  
Did he push, when he was uncurled,  
A golden foot, or a fairy horn  
Thro' his dim water-world.

## IV.

Slight, to be crushed with a tap  
Of my finger-nail on the sand.  
Small, but a work divine;  
Frail, but of force to withstand,  
Year upon year, the shock  
Of cataract seas that snap  
The three-decker's oaken spine  
Athwart the ledges of rock,  
Here on the Breton strand!—Tennyson, *Maud*.

*He shall hide me in his pavilion: in the secret of his tabernacle shall he hide me.—Ps. 27, 5.*

Know'st thou what wove yon woodbird's nest  
Of leaves, and feathers from her breast?  
Or how the fish outbuilt her shell,  
Painting with morn each annual cell?

Such and so grew these holy piles,  
Whilst love and terror laid the tiles.

The passive Master lent his hand  
To the vast soul that o'er him planned.

—Emerson, *The Problem*.

*Sources of the Illustrations:* The half-tone in No. 14 is by Mauve; No. 78 is from Wood's "Homes Without Hands;" Nos. 79 and 80 from Buckley's "Winners in Life's Race;" Nos. 81, 82 and 83 from Brehm's "Thierleben." The half-tone in No. 15 is "Return From the First Voyage," by T. E. Rosenthal; Nos. 85 and 88 are from Figuier, "Zoophytes et Mollusques;" No. 86 is from Morton's "Cyclopaedia of Agriculture;" Nos. 87 and 89 are from Martin's "Illustrierte Naturgeschichte." The half-tone in No. 14 was kindly loaned us by the publishers of the *Child-Garden*, an interesting and helpful monthly for the little ones.

## MOTHER NATURE'S CHILDREN.

I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.

II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Fish; 8. Plants.

III. *Setting the Table.* 9. Birds; 10. Monkeys to Spiders; 11. Insects; 12. Plants.

IV. *Clothing the Family.* 13. Birds; 14. Animals; 15. Mollusks; 16. Plants.

V. *Learning to Walk.* 17. Men and Quadrupeds; 18. Insects; 19. Centipedes; 20. Snakes and Worms.

VI. *Getting Wings.* 21. Bats and Squirrels; 22. Birds; 23. Butterflies; 24. Seeds.

VII. *Helping each other.* 25. Men; 26. Beavers; 27. Termites; 28. Flowers.

VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.

IX. *Borrowing and Lending.* 33. Men from Animals and Plants; 34. Animals and Insects from Plants; 35. Plants from Earth; 36. Earth from Sun.

X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.

*The happiest man is he who learns from Nature the lesson of worship —EMERSON.*

## Mother Nature's Children.

### IV.

#### CLOTHING THE FAMILY.

##### Part IV.—Plants.

In a drear-nighted December,  
Too happy, happy tree,  
Thy branches ne'er remember  
Their green felicity;  
The north cannot undo them  
With a sleety whistle through them;  
Nor frozen thawings glue them  
From budding at the prime.

In a drear-nighted December,  
Too happy, happy brook,  
Thy bubblings ne'er remember  
Apollo's summer look;  
But with a sweet forgetting,  
They stay their crystal fretting,  
Never, never petting  
About the frozen time.—*Keats.*

#### CLOTHING THE PLANTS.

"Spring has come again" is what the German artist is trying to tell us in this beautiful picture. You can see that the trees are all bare of their leaves still, but you can perceive one or two blossoms in front of the little boy and quite a cluster of them behind the dear little girl; and I think she has a bunch of flowers in her hand and that she and her brother have gathered, and I fear that the thoughtless boy is trying to catch the butterfly that is sipping a little honey from one of the flowers. But what do you think the mother is looking at with such a happy expression on her face? If you will follow her glance you will see a tiny bird sitting at the door of his little house up in the tree. Perhaps it is the first bird she has seen since the last summer. During the long, cold winter, when the ground was frozen and covered with snow, nearly all the birds have been far away in the warm south, but when spring comes they fly north and we see them again everywhere. And we are very glad to see them, not only because we love their charming ways, but because we enjoy spring and summer much



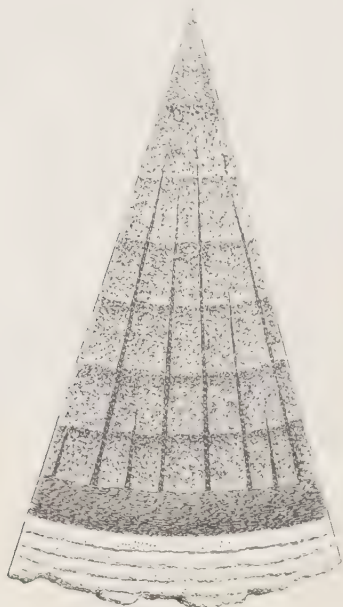
more than we do winter. In winter we have to stay indoors where there is a fire, or if we go out we are compelled to wrap ourselves up in a lot of warm clothes to keep Jack Frost from nipping our fingers and toes. The mother in this picture had to be very careful of that sweet little baby, and keep him well clothed and warm during the cold weather; and that little girl by her side, whose curly head she is caressing, had to be kept warm, too, while even the boy needed pretty thick clothes



when he went out to play or to go to school.

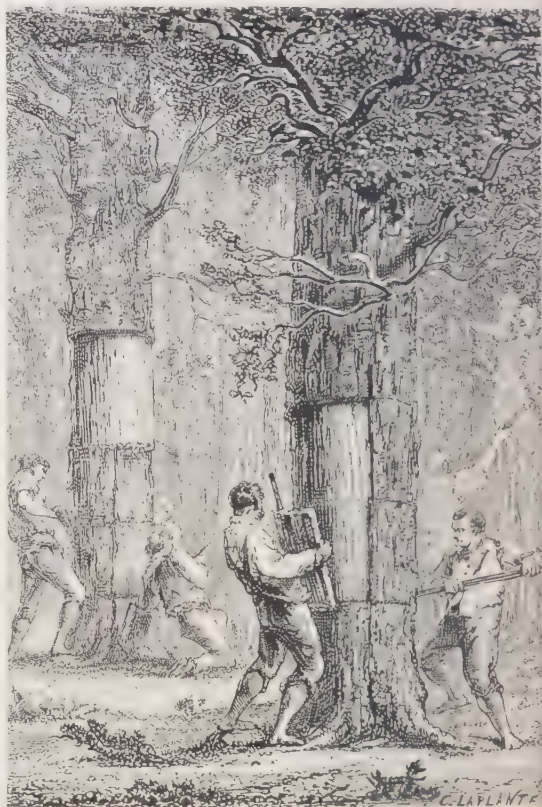
But how do you suppose the trees and plants manage to live during the cold weather? They cannot fly away to a warmer land, like the birds, and so escape the cold. The tree in the picture has to stand right there all winter long and so do the shrubs; and all the flowers are staying somewhere in the field or by the roadside till spring comes again. How do they manage to do it? Do they have clothes like all the other creatures? Certainly, they do.

You can see the rough bark on the tree in the picture. That bark is the clothing of the tree and wraps the trunk and branches of the tree all



91. A PIECE OF OAK CUT ACROSS.

around. In the picture of a slice of oak cut across you can notice how thick the bark is at the bottom of the picture, and you can see that there are several layers of the bark, and the outer layer seems breaking away. Each spring the tree has a new layer of bark, a new suit of clothes, and the new suit is put on inside of the old suit. As the tree is growing larger all the time, the new suit has to be larger than the old one, and so the old one stretches and cracks more and more till it falls off, as you see it doing in the slice of the tree; or till it is taken off, as you see done in the next picture, where men are taking off the outer and older coat of the cork oak. That bark is used to make stopples for bottles, and if you will look at one of the stopples you will see what the outer bark of the tree is like. Mr. Cork Oak has to make himself a new suit every spring and each suit is between one and two inches thick. Of



92. TAKING OFF THE OLD COAT OF THE CORK OAK.

course he has to be very busy in the summer making these new clothes. He has to reach out his roots and leaves for the material to be used in making new clothes, and then he has to work hard early and late, spinning and weaving his cloth and making it up into garments; for he has to be his own tailor as well as his own cloth-factory. And he has to patch his clothes, too, as



93. THE BABY IRIS IN ITS WINTER FLANNELS.

you will see if you cut into the bark, for he will soon cover the cut place with new bark. But when winter comes and Jack Frost is about, the tender leaves and soft rootlets would be frozen, as your fingers and toes would if you left them bare all winter.

So the tree makes some tiny new leaves, before winter arrives, and keeps them wrapped up in the bark or in a lot of warm scales, laid one over the other, as you see in the picture of the baby iris in its winter jacket. In the very center of the picture is the baby plant who is to come out in the spring and grow and blossom and bear fruit in the summer and leave another baby plant snuggled away in wrappers for the next spring. If you should cut through the leaf-buds on the trees—as on the horse-chestnut—you would find the same layer of wrappers and the same tiny cluster of new leaves for the next spring, and in some plants there are downy coverings to keep the baby leaflets still warmer. The mother plant has little, soft hairs grow, something like those in the picture of hair-clothing, to keep them from thawing and freezing in the winter so that “frozen thawings” may not “glue them from budding at the prime.” And I noticed the other day at Jackson Park that some of the new shrubs, five or six feet high, had fine, soft hairs thickly covering the upper, newer part of the plant while the lower and older portion



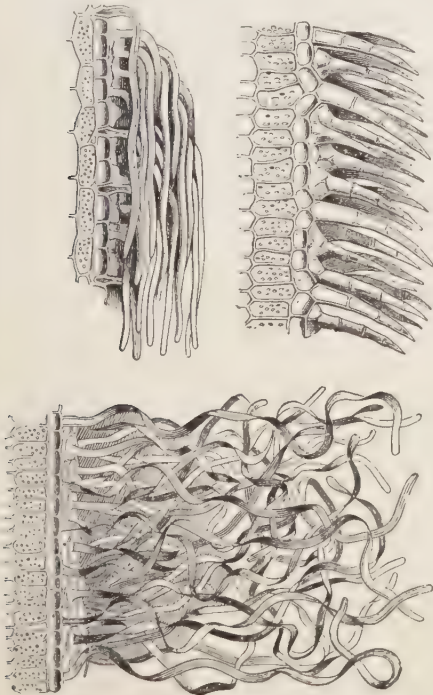
95. THE ANATTO SEEDS IN BABY JACKETS.

had only bare bark. Somebody—and not the city gardener, either—had wrapped the tender part of the plant in hairs.

But the baby seeds are even more carefully clothed than the baby buds. The mother trees are careful to wrap them up so that they cannot be harmed by sun or rain or hungry creatures. In the picture of the anatto seeds you see what safe baby-jackets the little ones have on. They are covered with stout hairs to prevent the birds from eating them; and the jacket is thick to keep the seed from feeling the sun's heat too much, just as the burrs of the chestnuts are thick and rough for the same reason.

In the next picture, the one that is half dark and half light, you see how the babies are protected from the rain. The light side shows how the jacket is when the sun shines, and you see there that all of the little coats are open and turned back at the top. The little collars are turned down, as it were. But as soon as it threatens rain the collars are all turned up, as you see them in the dark side of the picture, which represents the same plants in a rain storm. I don't know whether the mother tree turns up the collars or the baby seeds do it, or whether the coats turn up their collars themselves. That would be a fine sort of a coat that knew enough to turn up its own collar when it rained, wouldn't it?

But when the seed-babies have been kept dry



94. THE HAIR-CLOTHING OF LEAVES.



and comfortable long enough to be ready to go to sleep in the ground, the mother tree not only puts a bottle of condensed milk beside the baby, but she wraps a comfortable jacket about the baby and the milk both, as you can see from the last picture, the one of the lime babies. In the ball at the bottom of the picture you can make out the baby in its white milk and two different coats, and on the outer one you can see some fine hairs, to keep the little one still more comfortable while waiting for spring during the long, cold winter.

So you see how well clothed these baby plants are before they leave their mother-tree; but after they have fallen to the ground and Jack Frost is hunting for them, somebody still looks after them and makes them still safe by spreading a great warm comforter over them. For the snow is a



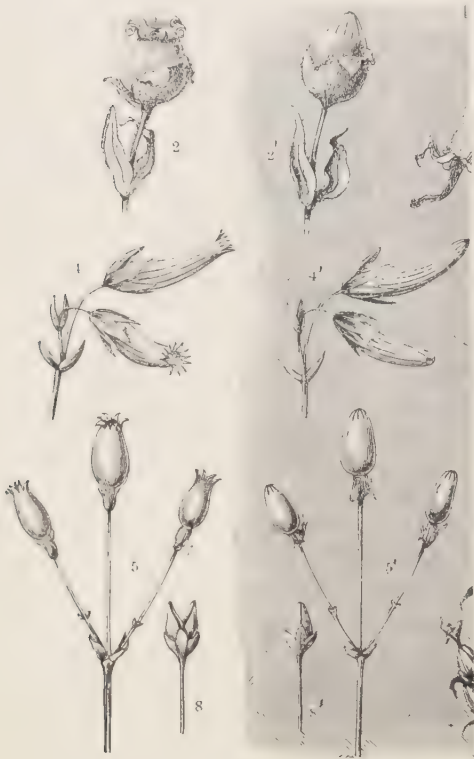
97. THE LIME BABIES IN WINTER JACKETS.

comforter to the baby seeds and keeps them much warmer than they would be without it. Somebody evidently loves all these creatures and protects them from the cold, as the human mother loves and protects her little ones,—Somebody who is wise enough to know how to make feathers and hairs, shell and bark, and a thousand other kinds of garments. But this wise and loving Somebody compels all the children to work for their clothes—except, perhaps, the babies who have their mothers to work for them. The moment one of her children stops working, she stops clothing it. She will have no idlers in her great family.

*Shall he not much more clothe you?—Matt. 6, 30.*

For well the soul, if stout within,  
Can arm impregnably the skin;  
And polar frost my frame defied,  
Made of the air that blows outside.

*Emerson, The Tiltmouse.*



96. SEED JACKETS IN SUNSHINE AND IN RAIN.

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Any school botany will have something to say about bark and seed-shells, but the best preparation is an hour or two spent in studying leaf-buds, bulbs and bark on the trees, and shells on the seeds. If you can start some leaf-buds in water and show them to the children, that will be better still.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read. Make it more concrete by

bringing in, if possible, some specimens of bark on both twigs and trees, and of bulbs and leaf-buds, to show their structure to the children. But be sure to make it teach not plants but Nature's care for plants.

*Sources of the Illustrations:* The half-tone is "Spring Has Come Again," by Robert Beyschlag. Nos. 91, 92 and 93 are from Figuier's "Vegetable Life;" Nos. 94, 96 and 97 are from Kerner's "Natural History of Plants;" and No. 95 is from Baillon's "Natural History of Plants."

*The happiest man is he who learns from Nature the lesson of worship*—EMERSON.

## Mother Nature's Children.

### V.

#### LEARNING TO WALK.

##### Part I.—In Water.

I will go back to the great sweet Mother,  
Mother and lover of men, the Sea.

—Swinburne.

Clear and cool, clear and cool,  
By laughing shallow and dreaming pool;  
Cool and clear, cool and clear,  
By shining shingle and foaming weir;  
Under the crag where the ouzel sings,  
And the ivied wall where the church bell rings,  
Undeiled for the undeiled;  
Play by me, bathe in me, mother and child.

Dank and foul, dank and foul,  
By the smoky town with murky cowl;  
Foul and dank, foul and dank,  
By wharf, and sewer, and shining bank;  
Darker and darker the further I go,  
Baser and baser the richer I grow;  
Who dare sport with the sin-defiled?  
Shrink from me, turn from me, mother and child.

Strong and free, strong and free,  
The flood-gates are open, away to the sea;  
Free and strong, free and strong,  
Cleansing my streams as I hurry along  
To the golden sands of the leaping bar,  
And the taintless tide that waits me afar,  
As I lose myself in the infinite main,  
Like a soul that has sinned and is pardoned again.  
Undeiled for the undeiled;  
Play by me, bathe in me, mother and child.

—Kingsley.



#### LEARNING THE USE OF LIMBS.

This bright little fellow in the picture would surely fall if his mother had not held him up and steadied him by putting her hands under his arms. She is teaching him how to use his limbs first, and then after that she will let him learn how to hold himself up and balance himself while walking about. Under the bench you can see three kittens who have already learned how to keep their balance while walking about, and yet they are not nearly as old as the little boy. How do you suppose they learned to walk so much quicker than he? It is because they have four feet to stand on, while he has only two, and it is

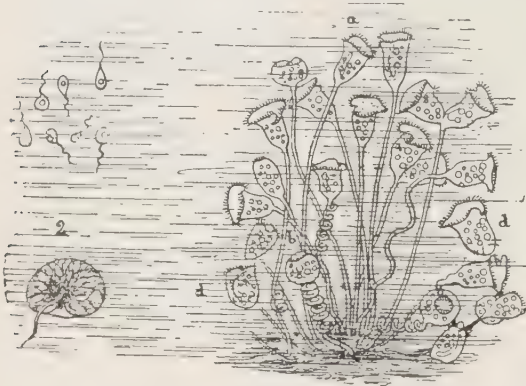
much easier to stand on four feet than on two, and it is still easier to stand on a dozen feet.

But even in learning to walk on a dozen feet the little ones have to be held up by somebody's tender hands. So the first babies that were born in this world were born in the water and not on the land. If you ever took your father's hand and walked out into the water till it came up to your neck, you know how light it made you feel. You could hardly keep your feet on the bottom. That was because the water held you up on all sides; and if you had been a little lighter you could have floated as a piece of wood does. Then you would have been able to learn



how to make your limbs go, while you were held up and balanced by the soft arms of the water; and that is the way the earliest babies of all learned to move about.

But they did not exactly use their feet at the very first. They paddled themselves along in the water by waving a sort of tail back and forth, something as you wave a fan back and forth to cool yourself. The fan, by being waved, moves the air; but if you were in a boat and should wave a fan back and forth in the water you would find that you would make the boat go by your waving. In this way the earliest babies waved their little fans and pushed themselves along. You can see some of them in the picture of the protista learning to move. The little creatures in the upper left-hand corner of the picture are monads, as they are called, and move through the water by waving their tiny whip-like tails. They are so small that you could not see them without a magnifying glass. In the bottom of the picture, however, right under them, is a larger baby. The round part of it is in reality about as large as the head of a pin, but it has been magnified here, and you can see the little tail that it wags when it wishes to travel about. I don't think you could see even this baby in the



99. THE PROTISTA LEARNING TO MOVE.

day time, because it looks so much like the water it lives in; but in the night it glows with a light that makes it visible when there are a lot of them together. I remember once, when we were on a yachting trip, sailing at nightfall into a beautiful bay on the coast of Maine, where the water was all aglow with their light. When we pulled ashore in our little row-boat after dark it seemed as if our oar-blades were dipping into liquid fire.

But though these creatures are so small that you cannot discover them, I am sure that you have all seen tadpoles, or pollywogs, as they used



100. FROGS LEARNING TO MOVE.

to be called in my boyhood. Those little black things without much but head and tail are the baby toads and baby frogs. You can find them in the picture of the frogs learning to move, and you can see that they are all sizes; and as they grow they gradually get legs and lose their tails and become like their parent frogs, and hop out of the water upon the hard ground. But their parents put them in the water as tiny eggs, like those you see at the right of the picture, and the soft warm arms of the water nestle them till they hatch out as little tadpoles. Then these same arms hold them up and steady them while they are learning to use first their tail and then their limbs.

I suppose that this is the way all of Mother Nature's children learned to move about, and to manage their legs and arms, and I suspect that she intended to have us all learn to walk as soon as we grew up. But some of the children found it so easy and pleasant in the water—in the Mother's soft arms—that they never tried to walk about on the hard land; or if they tried, they did not try earnestly enough to succeed. The whole fish family have remained in the water all their lives. They have not even learned to breathe air, when they outgrow their infancy, as the frogs have done, but they still continue to breathe water and use their hands and feet only for fins to steer and balance themselves in the water as they force themselves along by their strong tails. In the picture of the little



101. THE STICKLEBACKS WITH FINS FOR ARMS.

sticklebacks and their nest you can see the broad fish-like tail and, in the upper fish, the two side fins thrust out to balance him, as you would stretch out your arms to steady yourself.

But the tortoise, which you see in the picture, has learned how to breathe the air, even when a baby, and so Mrs. Tortoise does not lay her eggs on the water. She climbs up out of the ocean on some sandy beach and digs a hole in the sand to put her eggs in. When they hatch, and the little ones come out of the shell, the tiny creatures make straight for the water. Even if you take one of them a long distance from the nest and turn its head away from the ocean, the wise little thing will turn right around and begin to



102. THE TORTOISE'S LIMBS WITHOUT FEET.

plod slowly and painfully towards the water. It has n't really learned how to walk on the land, but it knows how to paddle in the water and go very fast, so fast that you would not be able to catch it. This particular turtle in the picture is the one that gives us the tortoise-shell, which we use for knife-handles, combs and such things. The scales you see on his back are the tortoise shells. He can swim so well that he goes out on the ocean a long distance from the land. He seems to think the sea is a better mother to him than the land, and so he does not try to be anything but a helpless baby on land all his life.

In the picture of the Greenland seal you see another creature which has learned not only to breathe air, but also to nurse her little ones with milk, just as a cow or a cat does. But if Mrs. Seal ever learned to walk on the land she has lost her knowledge, for she is only able to flop along in the most awkward way, helping herself a little by her fore-limbs, but dragging her hind-limbs helplessly behind her. It is thought that



103. THE SEAL'S LIMBS WITHOUT FEET.

she did once walk on the ground, because she has all the bones she needs for that purpose; and when her little ones are born she or her husband has to teach the baby seal how to swim and dive. They do not seem to take to the water as the turtles do. But they can swim very well indeed. A Scotchman who lived by the seashore captured one of these baby seals and brought it up with his little children, and it would play with them like a dog. And once when the children were playing by the water two of them fell in and were in danger of drowning. But the seal sprang into the water and seized one of them in its mouth and brought him to shore, and then swam out and caught the other in the same way and brought him safe to land.

In the last picture you can see the manatee, who lives in the water and feeds on the sea weed, as you see her doing. She has fins for arms,





104. THE MANATEE WITH ONLY ARMS.

though she nurses her baby and holds him in her arms just like a human mother. But she has staid in the water so much that she has actually lost some hind-legs that she used to have, and she has only a tail left like a fish's tail. For the men who study living creatures tell us that if we get feet and learn to walk with them and then stop using them, we shall lose the use of them as the seal has done, or we shall lose them altogether, just as the manatee has done. Mother Nature holds her arms under her children to help them get the use of arms and legs, but she does not seem to compel them to have hands or feet. If they do not want to walk but prefer to be babies all their lives, she takes the feet and sometimes the legs away, and lets them have fins and tails

### SUGGESTIONS TO TEACHERS.

*For Preparation:* The Encyclopædia Britannica has a full and well illustrated article on the "Protista," and Buckley's "Life and Her Children," and "Winners in Life's Race" both have clear accounts of the development of organs of locomotion.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read. Make the pictures and the descriptions teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. In teaching these lessons the children will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*Sources of the Illustrations:* The half-tone is "The First Step," by H. Ohmichen; No. 99 is from Buckley's "Life and Her Children;" Nos. 100, 101 and 104 are from her "Winners in Life's Race;" Nos. 102 and 103 are from "A World of Wonders."

*Outline of the Course for the Year:* It will be seen by the outline given before that there are ten differ-

instead. Even then she is kind and thoughtful for them and helps them to change their body and limbs, so that they can swim rapidly and get food and escape from danger. But she seems to love most and help most those of her children who try hardest to get out of the water and stand on their feet and walk and use their hands, as we shall see in the next lessons.

And I suppose the Great Mother will help most and love most those boys and girls who try hardest to walk in the right way and do the right thing, and I fear that if we do not try to do right and walk right we shall lose our ability to do so, as the animals lose their feet when they do not use them. And that would be very terrible, wouldn't it? So I do not believe that we really wish to "go back to the great sweet mother," except to love her and thank her for having held us in her soft arms and rocked us on her heaving breast when we were tiny helpless infants, like the monads.

*Thy way is in the sea, and thy path in the waters, and thy footsteps are not known—Ps. 77, 91.*

*Thou hast set my feet in a large room.—Ps. 31, 9.*

*He that walketh in a perfect way, he shall serve me—Ps. 101, 7.*

ent topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, "Setting the Table" through the third, "Clothing the Family" through the fourth, "Learning to Walk" through the fifth, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

### MOTHER NATURE'S CHILDREN.

I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.

II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Fish; 8. Plants.

III. *Setting the Table.* 9. Birds; 10. Monkey; 11. Spiders; 12. Insects; 13. Plants.

IV. *Clothing the Family.* 13. Birds; 14. Animals; 15. Mollusks; 16. Plants.

V. *Learning to Walk.* 17. In Water. 18. On Land. 19. On Four Feet. 20. On Two Feet.

VI. *Getting Wings.* 21. Bats and Squirrels; 22. Birds; 23. Butterflies; 24. Seeds.

VII. *Helping each other.* 25. Men; 26. Beavers; 27. Termites; 28. Flowers.

VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.

IX. *Borrowing and Lending.* 33. Men from Animals and Plants; 34. Animals and Insects from Plants; 35. Plants from Earth; 35. Earth from Sun.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### V.

#### LEARNING TO WALK.

##### Part II.—On Land.



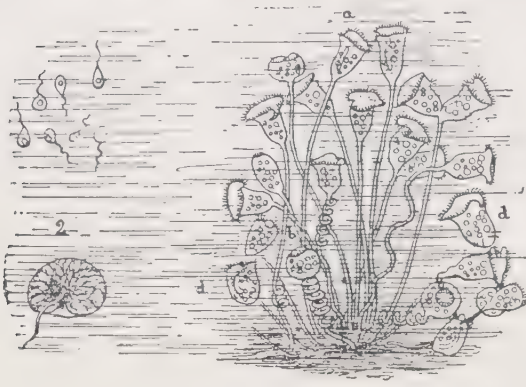
#### HOW THE SMALLER CHILDREN WALK.

Poor little fellow! He is tied to the tree, isn't he? I suppose the mother had to be so busy that she couldn't look after him or hold him in her arms. Perhaps she was doing the washing for the family. For in France, where this picture was painted, they have the pretty custom of taking the clothes to a stream and washing them there, and standing with bare feet in the water while doing it. But though the mother was so hard at work that she could not look after her little boy, you can see that she loves him, for she has made him as comfortable as possible. She has spread soft rushes on the ground for a carpet, and taken her soft scarf for a rope and tied him as loosely as she could without letting him slip out. And of course it was only her love that made her tie him at all. She loved him so much that she did not want him to fall into the stream, and perhaps get drowned.

Mother Nature, too, is something like this mother, for she ties some of her children, as you

can see from this very picture. That tree, to which the little fellow is fastened, is one of her children, and yet it is tied fast, so that it can neither float nor walk. It can only stand still. And the reeds and rushes growing in the edge of the stream are also tied. And some of the animals are tied, as well as the plants. In the picture we had last week of the swimming monads and night-lighter,—which we have again this week,—you see on the right what looks like a plant growing out of the ground with bell-like flowers. But it is not a plant, it is a little creature that goes swimming about in the water by waving the little fringe of hairs you see on the edge of the cup. But when it gets tired of swimming it settles on the ground in a still place and pushes out a little foot from the bottom of the cup into the ground, and keeps pushing it more and more till it has a regular stalk and looks so much like a plant that it is called the Bell-flower. And its babies are little buds that grow out of the stalk-like leg and then break off and float away and develop a stalk of their own. You can see some





106. THE BELL-FLOWER TIED TO THE GROUND.

of the stalks at the right of the picture with two cups on each one. One of the cups is the mother and the other the baby, who will soon drop off and swim away.

But Mother Nature does not seem to tie any of her children who don't want to be tied. It looks as if she put them all in the water first, that they might find it easier to move than to stand still. Indeed, she spread water over all the earth at first, so that there was nothing but water for the earliest babies. She held them in her soft water-arms and tried to coax them to move a little, even if it was nothing more than the waving of the tiny hair-like tails. If any of her children were afraid to walk or swim she tied them softly and lovingly to the ground. But all of her children who were brave and tried to swim and walk she helped more and more. She let them get limbs and feet, even while they were in the water,



107. THE SEA-WORM WALKING WITH A HUNDRED LEGS.

and then coaxed them to climb out on the land and use their limbs and feet to walk with. In the picture of the sea-worm you can see ever so many legs which the creature has got, one pair for every joint of his long body. He has got his legs by swimming in water first, and then walking about on the ground at the bottom of the ocean, and the more he walks the stronger and more handy his legs become.

But it seems as if he was nothing but legs. He has a hundred of them, I should say. That is more than he really needs for walking. And so Mother Nature tried to teach her children, when



108. THE LOBSTER.

they had once learned to walk, to use some of their many legs for something else than walking. If you will look at the picture of the lobster, or at a real one, if you can get it, you will see some of the things he does with his legs. He uses eight of them,—four on each side,—for walking, and you will notice that by using them he has got them so they will bend in joints; and two of them on each side have divided into toes at the end. Then there are the two big ones, the pincers, as they are called, because they have those jaw-like pincers at the ends. And they are used as we use our teeth, to break up our food, as well as to seize it. In front of these hands, changed to jaws, are seven other pairs of legs that are used to make the mouth, the feelers and the eyes,—for the eyes are on legs or arms, as the jaws are. So you see the lobster took fourteen legs to make one head, and not a particularly good one either,

I suppose you think. But Mother Nature and the lobster seem to think it was worth all those legs. But even this is not all the lobster has done with his superfluous legs. If you look closely you can see several feathery things hanging down under the body back of the eight feet. Those are some more legs that have been changed into swimmerets, to help the lobster swim. And Mrs. Lobster uses them to hold her little baby lobsters. The tiny things cuddle under their mother, holding fast to these feathery feet. They swim out in the water when all is still, but if any danger comes they scurry back under her; and so the fishermen call the mother the hen-lobster when she carries her babies about.

But now that Mother Nature has got some of her children to use some of their legs for eyes and feelers and jaws, and arms to hold their babies, the next thing is to get them out of the water



109. THE SCORPION AND THE CENTIPEDE.

onto the land, where they can breathe better air and walk faster. And in the picture of the scorpion and the centipede you can see some of her children who walk on land. To be sure, one of them seems to be still all feet. He is called "centipede," which is a word that means "hundred-footed," and though he hasn't quite so many feet as that, he has more than he needs. But it is something to have climbed out of the water, and you will find that this creature is much brighter than the hundred-footed sea-worm. But the scorpion has only the four legs of the lobster and those terrible arms with jaws at the end, a good deal worse than a fist or a pair of boxing gloves. And he has a claw in the end of his tail with a poisonous sting to it, that seems to have taken half a dozen pairs of legs to make. So you see he is pretty well protected. But there are not



110. THE SPIDER WITH EIGHT FEET.

very many scorpions in the world, in spite of their protection, so that Mother Nature seems to like her other children better than she does this one. She seems to prefer the spiders, for there are ever so many more of them. You remember the one that we had a while ago cradling her baby in a soft ball which she carried about with her. If you count her legs you will find that she has four on each side, like the lobster and the scorpion, and if you will look closely at the one in the picture you will see what seems like another short one right in front. That is one of the fourteen legs she took to make her head, and she uses that one for a feeler. And at the other end of the spider you will see some silken threads going to the cradle. Those threads are spun by Mrs. Spider, and I suppose she uses some of those extra legs to make her spinnerets, as they are called. She has learned to walk on only eight legs and use all the rest for something else than walking.

But most of Mother Nature's smaller children have learned to get along with only six legs, like Mrs. Carpenter Bee, in this picture, which you remember we had before. You can see the six legs with tiny claws at the ends,—so that she can hang on to the wood of the tree, as you see her



111. THE CARPENTER BEE WITH SIX FEET.



doing,—and little hairs along the sides to brush herself with. For insects have to keep themselves very clean. If they did not they would soon become blind; for their eyes have no lids to close over them and keep the dust away, or wipe it off when it falls, as our lids do when we wink. So you will often see a fly in summer standing on her four hindlegs and using her two front legs to wipe off her eyes. And if you watch her closely you will see her also brush off her body. She has to do that because she breathes through little holes along her body, and not through her nose and mouth, as we do. If she should allow those holes to be stopped up she would die of suffocation, as we would if someone should stop up our mouth and nose. And in the picture of the ants you can see one of them sitting up on her four hind legs to brush her face and eyes with her front limbs. But in the other picture, the ant is hanging from a rod to clean her air holes, and



113. THE PRAYING MANTIS.

means "priest." She was really holding up her hands to try to get her daily bread, and I suppose that this was a sort of prayer,—perhaps the only sort that insects make. And it may be that the wise Mother Nature has coaxed her smaller children out of the water and up on their feet—from a hundred feet to ten, to eight, to six, and now to four,—by keeping them hungry all the time so they would exert themselves and try to walk better and work better. And she has helped them all the time, so they might not fall, but might be able to stand firmer and run faster and care for their little ones better and better. Perhaps that is the way she answered their prayers. Do you think it is a good way?

*Seek and ye shall find.—Matt. 7, 7.*

Oh yet we trust that somehow good  
Will be the final goal of ill;

That nothing walks with aimless feet;  
That not one life shall be destroyed,  
Or cast as rubbish to the void  
When God hath made the pile complete;

That not a worm is cloven in vain;  
That not a moth with vain desire  
Is shrivelled in a fruitless fire,  
Or but subserves another's gain.

—Tennyson, *In Memoriam*.

### SUGGESTIONS TO TEACHERS.

*For Preparation:* In the Encyclopædia Britannica, under "Crustacea" and "Insects," an account of the change of limbs to other organs will be found; but the study of some actual insects and lobsters will give a much better preparation.

*Sources of the Illustrations:* The half-tone is "A

Captive," by Leon Olivié; No. 106 is from Buckley's "Life and Her Children;" No. 107 is from Wood's "Natural History," Vol. III; No. 108, from Hess' "Bilder aus dem Aquarium," Vol. I.; Nos. 109 and 112 are from Jones' "Animal Creation;" No. 111 is from "The Natural History of the Agricultural Ant of Texas," by Rev. H. C. McCook, who has kindly allowed us to reproduce it.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### V.

#### LEARNING TO WALK.

##### Part III.—On Four Feet.

##### THE BLOOD HORSE.

Gamarra is a dainty steed,  
Strong, black, and of a noble breed,  
Full of fire, and full of bone,  
With all his line of fathers known;  
Fine his nose, his nostrils thin,  
But blown abroad by the pride within!  
His mane is like a river flowing,  
And his eyes like embers glowing  
In the darkness of the night,  
And his pace is swift as light.

Look,—how round his straining throat  
Trace and shifting beauty float;  
New strength is in his reins,  
And the red blood gallops through his  
veins,—  
Richer, redder, never ran  
Through the boasting heart of man.  
We can trace his lineage higher  
Than the Bourbon dare aspire.

—Barry Cornwall.



##### WALKING ON TIPTOES.

This little fellow is having a fine time riding on his father's large, high-spirited horse. His mother stands on the verandah watching him, and should not wonder if she were a little anxious about him; and his grandfather, too, is standing by to see that no harm befalls him. But an older boy has hold of the reins so that the horse cannot run away, if he really wanted to. But I do not believe he wants to run away. He is fond of the little fellow and is proud to be allowed to carry him on his back, as you can see from the way he looks, and he would probably come to him rather than run away. I read not long ago of a horse up in Canada that would not only come to meet his mistress, as so many horses do, but on the occasion, when he saw her fallen into the river and drowning, rushed into the water and seized her dress by his teeth and brought her safe to the shore. And I feel sure that this horse loves his master and is glad to carry him on his

back; and as soon as the master comes from the house and mounts in the place of his little boy, the horse will go galloping off as swift as the wind and bear his rider safely and easily a hundred miles or a thousand miles without once complaining.

And how do you suppose this horse has learned to walk and run so fast and so well? How has Mother Nature helped him to get such long and strong legs and to learn to use them so skillfully? You remember that Mother Nature did not always have such swiftly running creatures among her children. When there was water all over the earth, there were no horses or cows, or lions or bears, or any creatures excepting those which swam in the water. We saw how the worms were coaxed out of the water, when there was dry land for them to stand on, and were taught how to



walk as insects on a lot of their tiny legs. And we saw, too, how the little tadpoles got legs and hopped out on the ground as toads and frogs. But insects and frogs are too small to make horses for men to ride on.

So if Mother Nature was going to give her men and women and little boys and little girls such fine horses as that one in the picture, she would have to take something larger than these small creatures to make them of. And men who study the rocks tell us that they find the remains of great creatures who were twenty or thirty feet long and had two flappers on each side of their



115. A FISH-LIZARD.

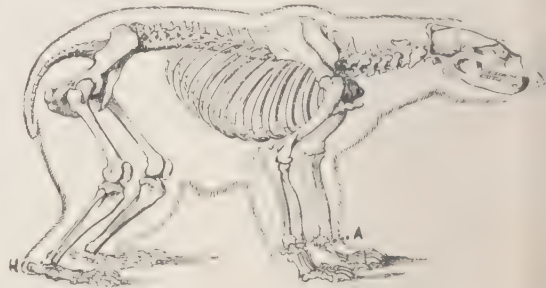
body to paddle themselves about in the water, where they lived long ages before men existed. You can see the skeleton of one of these creatures in the picture of the fish-lizard (115), and you can notice what a long head and tail he has. And though he has a lot of little bones in his limbs, he has not yet got any finger-bones or toe-bones. But in the next picture of some big babies getting out of the water (116), you can see how the fish-lizard gradually got fingers and toes by using his limbs to walk with. You can count the five fingers on the front limbs of these great babies. And you can see how it was that Mother Nature coaxed them to climb out of the water. She kept them hungry and kept the insects flying just above their reach, as you see her doing in the picture. They had to lift themselves up on



116. BABIES OF LONG AGO LEARNING TO WALK.

their legs and climb and jump to reach the flying food. The biggest baby, the one in the center of the picture, can just drag himself along by his legs with his body resting upon the ground, while the little fellow near him has lifted up his body a little; but the one on the right has raised himself up on his hind legs in his eagerness to catch that big insect.

Not all of these children learned to use their limbs equally well. Some of them stayed in the water because it was so much easier there. You see some of the big heads of those water-babies sticking out of the water in the picture. And I suppose they remained big fish and never learned to creep on the ground. Others only learned to creep and remained like our alligators. You remember we had a picture of an alligator mother defending her little ones against the attack of a bird. The alligators are not able to run fast and escape in that way. They can swim in the water rapidly enough, but they can only creep on the

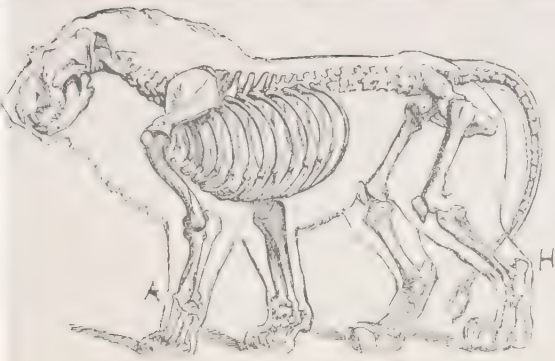


117. A BEAR WALKING FLAT-FOOTED.

land, because they have never learned to lift themselves up on their legs and walk and run.

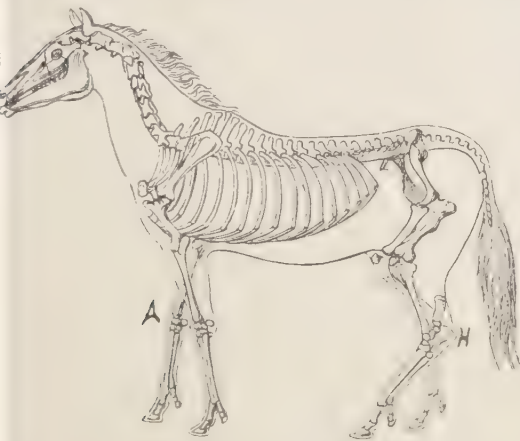
But some of Mother Nature's children did learn to get up on their legs and even to stand and run on their tiptoes. In the picture of the skeleton of the bear (117), you will see how flat-footed he walks. His hind feet are wholly on the ground so that his heel,—marked by the letter H,—is as low as the rest of his foot. And his front feet,—corresponding to our hands,—are also partly flat on the ground. The portion corresponding to our fingers as far as the knuckles, is on the ground, while the wrist,—marked A,—is a little higher. But in the next picture, of the skeleton of the lion, (118), you will see that the half of the foot is raised from the ground so that the heel,—marked H,—is a long way from the ground. The lion has learned to stand up higher, more on tiptoe, than the bear, and so he can run faster than the bear.

But in the skeleton of the Hipparion (119), which is the grandfather of the horse, you



118. A LION WALKING ON FINGERS AND TOES.

notice that both the hind feet and the fore feet are raised so high that the creature stands only on his toes, and his heels and wrists are half way up to his body. If you examine this last picture closely you will notice that there is something hanging down just back of each of the feet, looking like a little heel. It is not a heel at all, because the heel is a long way up on the leg. It is really the horse's extra toes. He started,—or his ancestors did,—with five toes on his feet, and gradually lost all of them save one. In the picture of how the horse lost his toes (120), the first part,—marked A,—shows the bones of the animal when he had lost only one toe, the big toe, or the thumb. The part marked B shows him when he had lost another toe, the little one. In C, his foot is like the foot of the hipparion in the picture, with two dwindling toes hanging down from above the middle toe, or the hoof, as we call it in the horse. The horse's hoof is his toe-nail; so that



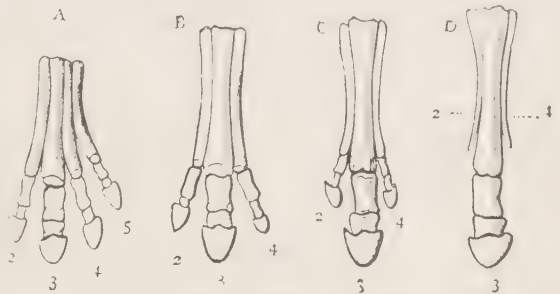
119. THE GRANDFATHER OF THE HORSE WALKING ON ONE TOE-NAIL AND ONE FINGER-NAIL OF EACH LIMB.

he really walks on his toe-nails and his finger-nails. In D, the two toes have shrunk to two little splints lying close to the big bone of the middle toe.

How do you suppose Mother Nature managed

this? Did she take away the toes the horse did not use and increase the size and strength of the toe he did use? That is just what she did. That is just what she does to all her children. Whatever part of their bodies they use she makes always larger and stronger, and whatever is not used she causes to grow smaller and weaker. But that is not all. When she wants to have swiftly running horses, she lets the bears and the lions capture and kill the slower horses, those that do not try hard enough to learn to run fast. All of the horses that had three, four or five toes have been killed off, but those that learned how to stand on tiptoe,—on one toe-nail of each foot and one finger-nail of each hand,—are the ones that fill the whole earth now.

But Mother Nature has done something else for us besides giving horses that are swift. She has made them gentle and loving instead of savage and cruel, like the lions and bears and alligators. And she has done it by coaxing the horse to save himself by running away instead of



120. HOW THE HORSE LOST HIS TOES.

by fighting, by being skillful instead of being merely strong and able to hurt and kill others. To be sure the horses will fight for their little ones, and so will the cows, gentle as they seem to be. I heard of a cow in Florida fighting an alligator that had tried to catch her calf who was feeding not far from her on the bank of a river. She rushed at the huge reptile and charged him with her horns again and again, till she actually drove him back into the river and so saved her baby. For a cow's horns are very strong weapons. And in the picture of a buffalo defending her baby (121), which you will find on the next page, you see her fighting a lion; and the missionary, Livingstone, tells us that she came out victorious over even this king of beasts.

But the cows have learned a better way than this. They live together in great crowds or herds, and keep the mothers and their babies in the middle of the herd, while the bulls with their sharp horns and strong heads covered all over with





121. A BUFFALO MOTHER DEFENDING HER CHILD.

thick hair to protect them from teeth and claws, are on the outside and face the wolves and bears and lions, and easily drive them off. And the horses do the same thing when they live by themselves. They gather in great herds with the mothers and colts in the middle and the fathers outside. No animal dares attack them then. In this way they

### SUGGESTIONS TO TEACHERS.

*For Preparation:* A careful study of the anatomy of the foot and hand and arm and leg in any standard book will give a clear idea of the subject. The *Encyclopædia Britannica* under "Anatomy," "Mammalia," "Reptiles," has material, though not arranged in the order we have used. Huxley's "Anatomy of Vertebrated Animals" also has a full, though technical account, while Buckley's "Winners in Life's Race" has brief but popular references to the use of legs and feet. Much help might be obtained through your family doctor and his books, and possibly his stock of skeletons.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read. Perhaps, if the class is not too large, you can show them by their own hands and feet how the lower creatures hold their limbs when they walk flat-footed and on fingers and toes, and on tip-toes. They will realize in this way how hard it is to climb up on the tips of the toes.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. In teaching these lessons the children will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*Sources of the Illustrations:* The half-tone is "In His Father's Footsteps," by S. E. Waller; No. 115 is from Carus Sterne's "Werden und Vergehen;" No. 116

can be gentle and yet be stronger and safer than the most savage creatures. So you see how long and how patiently the great Mother has been teaching her children to walk,—coaxing them upwards by their hunger, and driving them onwards by their fear of the savage animals pursuing them, and allowing the slower ones to be caught and destroyed,—till she has got such strong and swift and gentle creatures as the noble horse, an animal just fitted to carry man about over the earth. Does it not look as if she had planned to help man? Does it not look as if some great love lay under all these pictures of the past?

*Hast thou given the horse strength? Hast thou clothed his neck with thunder?—Job, 39, 19.*

Deep love lieth under  
These pictures of time;  
They fade in the light of  
Their meaning sublime.—Emerson.

and 119 are from Lütkin's "Skildringer of Dyrelivet;" No. 117 is from Packard's "Zoology;" No. 118 is from Jones's "Animal Creation;" No. 120 is from Clodd's "Story of Creation;" and No. 121 from Buckley's "Winners in Life's Race."

*Outline of the Course for the Year:* It will be seen by the outline given before that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, "Setting the Table" through the third, "Clothing the Family" through the fourth, "Learning to Walk" through the fifth, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

### MOTHER NATURE'S CHILDREN.

- I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.
- II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Fish; 8. Plants.
- III. *Setting the Table.* 9. Birds; 10. Monkeys; 11. Spiders; 12. Insects; 13. Plants.
- IV. *Clothing the Family.* 14. Birds; 15. Animals; 16. Mollusks; 17. Plants.
- V. *Learning to Walk.* 18. In Water. 19. On Land. 20. On Four Feet. 21. On Two Feet.
- VI. *Getting Wings.* 22. Bats and Squirrels; 23. Butterflies; 24. Seeds.
- VII. *Helping each other.* 25. Men; 26. Beavers; 27. Termites; 28. Flowers.
- VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.
- IX. *Borrowing and Lending.* 33. Men from Animals and Plants; 34. Animals and Insects from Plants; 35. Plants from Earth; 36. Earth from Sun.
- X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.

*The happiest man is he who learns from Nature the lesson of worship* —EMERSON.

## Mother Nature's Children.

### V.

#### LEARNING TO WALK.

##### Part IV.—On Two Feet.

##### THE BABY.

No shoes to hide her tiny toes,  
 No stockings on her feet;  
 Her supple ankles white as snow  
 Of early blossoms sweet;  
 Her simple dress of sprinkled pink,  
 Her double, dimple chin;  
 Her puckered lip and bonnie mouth,  
 With not one tooth between;  
 Her eyes so like her mother's eyes,  
 Two gentle, liquid things;  
 Her face is like an angel's face,—  
 We're glad she has no wings.

—Hugh Miller.

##### STANDING ON TWO FEET.

Here is a little fellow creeping on his hands and knees, while his sister can stand up on her two feet without anyone to help her. She is holding fast to her mother's hand, but that is only because she loves her mother, not because she cannot stand alone. But her little brother finds it a great deal easier to creep than to walk. I think he can manage to walk if he tries hard enough; but it takes a great deal of thought for him to balance himself on his tiny feet and walk about the room without taking hold of anything with his hands to steady him. You watch your little brother when he takes his first steps and see how anxious and full of care he looks. He feels just as you do now when you try to walk the top rail of a fence. You have to think what you are doing and use your hands to keep your balance. So this brave little boy has to use his hands and his wits to balance himself on two feet alone. And he has to have feet that are flat at the bottom or he could not do it at all. If you try to stand on tiptoe, you will see that it takes all your thought to balance yourself then. But if you had four feet you could stand on tiptoe



very easily, as the horse does, or as the tables and chairs do on their four legs.

You remember how Mother Nature coaxed the horses to stand and to run on their four tiptoes. And now we are to have the story of how she coaxed her great babies up from four feet to two feet. You see some of those two-footed babies in the picture (123) at the top of the next page. They are cousins of the African ostriches, and they live in South America. It is the papa Ostrich that you see in the picture, and he is teaching his babies how to get food from the ground. For among these birds it is the papa who makes the nest and sits on the eggs. And when the eggs are hatched he gathers the young things under



his wings just as tenderly and feeds them and educates them just as carefully as any mother would. And he and all his babies are able to

very fast, indeed. The African ostrich can outrun a horse even. But you will notice that they have no hands. I suppose they had to use their hands so much to balance themselves in learning to walk and stand on the toes of two feet that they have changed them to wings.

In the next picture (224) you will see one of Mother Nature's babies who lived a long time ago. We can still find some of his bones and the prints of his toes in the rock, with



123. THE SOUTH AMERICAN OSTRICH AND HIS CHILDREN.

stand and walk and run on only two feet. Indeed, they can do it on the three toes of the two feet, as you will see by counting the toes of the baby ostriches. The heel of the foot is a long way up from the ground in all of them, except the papa and the little one at the very left of the picture. The papa has brought his whole foot down so that the heel is on the ground. He did it to get down closer to his babies, just as your papa will sometimes get down on his knees to be with his baby that is creeping on the floor. But when

the mark his tail made between the feet. You can understand from this "bird-snake," as they call him, how some of Mother Nature's children got up on two feet. You see they used their tails to help themselves, as this creature does, so that they really had three feet instead of two, and could stand alone, just as a three-legged chair can. This bird-snake has climbed up on his toes so that his heel is up close to his body, as you can see from the picture. But he has not yet learned to stand up with his legs straight. He is really sitting down on his tail and his knees are close to his body, as you can see by the upper part of his leg. And this is the way nearly all the birds stand.

And the kangaroo (125), too, is sitting down in the same way that the bird-snake is, except that her feet are flat, so that her heel comes down to the ground, as you can see better in the cut (126) showing the skeleton of the kangaroo. There you see the bones of the tail on the ground, and also the bones of the long, narrow foot. And you can see that the knees are just the same as yours are when you sit down in a chair. But these

bent knees make a nice lap with a soft large bag in it, where the mother kangaroo carries her babies. The head of one of them can be seen peeping out of the mouth of the bag in the picture. The kangaroo has not really learned to walk even on her three legs. She runs by hopping on her hind legs, and she can go a long distance at a jump. But though she has got her arms and hands free, she has not learned to make



124. THE BIRD-SNAKE STANDING ON TWO FEET AND A TAIL.

papa Ostrich wants to walk or run he will stand on his three toes, as you see Mrs. Ostrich doing in the back of the picture. And they can run



125. A KANGAROO MOTHER AND CHILD.

much use of them. You can see how short the arms and fingers are.

So the kangaroos do not seem to suit Mother Nature entirely. She has not trusted the world to the care of the kangaroos, any more than she has to the care of the birds. She has coaxed some of her brighter children to get better hands and arms, and at the same time to stand up with their leg-bones straight, and not bent as if they were sitting down, and to get along without using their tail as a cane to steady themselves. In the picture of the orang-outang (127),—the great ape that lives in Borneo,—you see that the hands and arms are all right. They are long and strong,



125. THE SKELETON OF THE KANGAROO.

and can hold almost anything, as they hold that stick. But why does the ape need to have that stick in order to stand up? If you look at his feet you will see. He has made hands of his feet as well as of his hands, and so has spoiled them for use in walking. His toes are all fingers and thumbs, so that he can hold onto the branches of a tree and climb about in it much better than a man could. But when he is on the ground he cannot walk or stand without using his hands to help him. And he has used his hands so much to help himself walk that they come almost to the ground, as you can see in the picture (128) of the skeleton of man and of the ape. You can see also that the bones in the man's foot make a strong flat, support to hold up the body. And you will notice, too, how much longer the

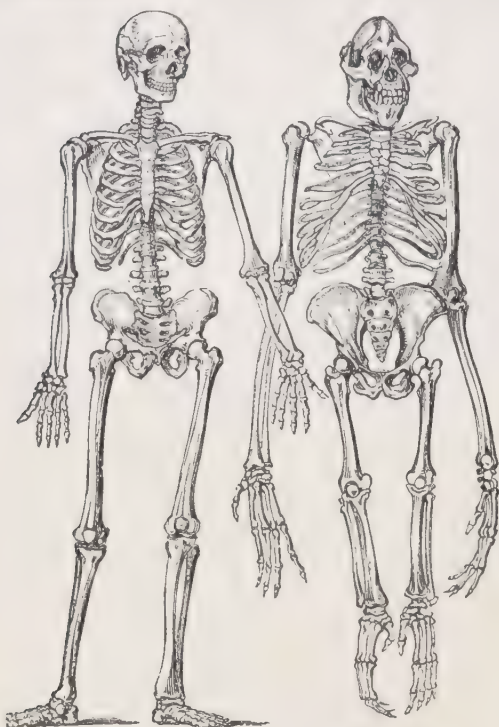


127. THE ORANG-OUTANG WITH HANDS FOR FEET.

bones in the man's legs are than those in the legs of the ape, so that the man's head comes as high as the ape's, although his heels go clear down to the ground.

If you could have visited this earth a good many hundred thousand years ago you would not have found any such creature as man living here. You would have found only four-footed creatures, like the lion, or four-handed creatures like the monkey, or two-footed creatures like the kangaroo or the birds. And when Mother Nature decided that she must have some creatures like men and women, she seems to have got them, as she got the reptiles out of the fish, and the horses out of





128. THE SKELETON OF A MAN AND OF AN APE.

the reptiles,—by taking those that were the boldest and quickest to learn, and giving them better limbs, as fast as they would use them. Some of the reptiles, like the crocodile, remained in the water because it was easier than to climb out on the land. So Mother Nature let them stay, but she made horses and cows and dogs and cats of those that were bold and quick to learn to walk on the dry land. And when Mother Nature wanted to get some two-footed creatures who would use their hands, the monkeys stayed in the trees because it was easier to get food and shelter

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*Sources of the Illustrations:* The half-tone is "Where Am I?" by Robert Beyschlag; No. 123 is from

there, and they were safer from wild animals.

But some of those early creatures in the trees were bold enough to leave the shelter of the branches and come down to the ground. And they tried so hard to think how to stand up straight that Mother Nature gave them better feet and better legs, and better heads, too; because the more you try to think the better and stronger your thinking powers grow, just as your feet grow stronger by using them. You can see from the picture how much larger the top of the man's head is than the top of the ape's head. And by thinking, man has made himself safer than the apes are in the trees or the reptiles in the water. He has thought out guns and houses to protect himself, and ploughs and other machinery to get food from the earth, and mills to grind his food and weave his clothes, and railroad trains to carry him even faster than the horse can run. All this he got because he was bold enough to creep out of the water, to climb up on his feet, and to quit the shelter of the woods, and to try to think of a better way to do things. And Mother Nature held his hand all the time, as the mother in the first picture is holding the hand of her older child, and she loved him well enough to help him all the time, too, and to give him more than she gave to her other children, because he tried harder to get it by thinking.

*Seek ye first the kingdom of God and his righteousness; and all these things shall be added unto you.*—Matt. 6, 33.

So nigh is grandeur to our dust,

So near is God to man,

When duty whispers low, Thou must,

The youth replies, I can.—Emerson.

Brahm's "Thierleben;" No. 124 from Lütkin's "Skildringer af Dyrelivet;" Nos. 125 and 126 are from Figuiers' "Mammals;" Nos. 127 and 118 are from Jones' "Animal Creation." I have taken the liberty of substituting English for Scotch in Miller's beautiful poem.

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## Mother Nature's Children.

### VI.

#### LEARNING TO FLY.

##### Part I.—Insects.

##### LITTLE DANDELION.

Gay little dandelion  
Lights up the meads,  
Swings on her slender foot,  
Telleth her beads,  
Listeth to the robbin's note  
Poured from above;  
Wise little dandelion,  
Asks not for love.

Pale little dandelion,  
In her white shroud,  
Hearerth the angel-breeze  
Call from the cloud!  
Tiny plumes fluttering  
Make no delay!  
Little winged dandelion  
Soarerth away.

—Helen B. Bostwick.

##### FLOATING IN THE AIR.

You see that one of the bubbles in the picture is lighter than the other. The one that has been set free has not fallen to the ground, but has floated in the air and has even gone up higher than it was when the little girl blew it up. Why does it not fall? It is made of nothing but a drop of soap and water; and if you should take a little of the soapy water in a spoon and hold it up as high as your head and turn it out of the spoon, it would drop right straight to the floor. And it would go so fast that you could hardly see it. But you take that same soapy water on the end of a straw pipe and blow it up till it is as big as your head, and then set it free from the pipe, it will behave very differently. If it falls, it will fall so slowly that it will take a long time to reach the ground. And if it feels the slightest breath of air blowing upward, it will stop falling and begin to rise with the air. When I was a boy I used to have a place at home where on pleasant days the bubbles we blew would go sailing up over the house-top instead of falling to the ground. They did that because the south wind blew up the chimney roof of the porch of the house and so



made an upward current to carry the bubbles. But the drops of rain from the eaves of that same porch would fall straight to the ground, as a drop of soapy water would from a spoon.

The reason the drop falls, while the bubble floats is because the bubble takes up so much more room than the drop, though they both have the same amount of water; and when they try to fall through the air, the tiny drop has to push aside only a little air while the big bubble has to push away a lot of air and needs a long time to do it. So too if you take a newspaper folded up tight and drop it, you will find that it will go straight and quickly to the ground, but if you take the same paper and spread it out and then let it fall, it will take a long time to reach the ground. And if a gust of wind happens along, it may



sweep it a hundred feet or more before it gets to the earth.

And in this same way Mother Nature's children can float in the air and sail a long way by spreading themselves out thin, like an open paper, instead of folding themselves up close. In the picture (130) of some winged seeds you can see three different seeds, and the one on the right looks as if it had a pair of wings like a fly. That is the seed of the sugar maple, the tree that gives us our maple sugar. When Mrs. Sugar Maple has her tiny baby put to sleep and packed away in his little seed-case and ready to start in life for himself, she does not drop him right down on the ground by her own feet. The baby tree could not grow there because he would be in his mother's shade, and if all the baby maples dropped down there they would find no room and would be crowded to death. So Mrs. Sugar Maple sends her child out into the world, something as the human mother does; only the human mother packs her boy's trunk and buys him a ticket on the railroad which will take him to some place where he can have a good chance to start in life, while the tree-mother packs her boy's seed-case with food and gives him a pair of light, wide-spread wings, and when the wind blows briskly some day, she bids him good-bye and puts him aboard the wind-train to find a new home far away, where he can have more room than he

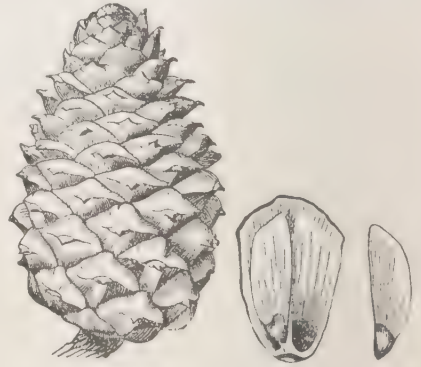


130. SOME SEEDS WITH WINGS.

would have close by his mother and crowded in with all his hundreds and thousands of brothers and sisters. If you will watch the seeds of the maple trees as they fall on a windy day you will see how far they can float before they finally reach the ground.

The elm tree also provides its baby-plant with wings as you can see in the middle seed of this same picture. That is the seed of our American elm and it has its covering spread out thin all around it and then pressed down flat, so that the wind-train will carry it far away from its early home. And the seed on the left of the picture is

that of the white ash. Mrs. White Ash has given her boy a ticket on that same wind-train that the others ride on. In the next picture (131), of the pine-tree's cradle, you can see the way Mrs. Pine-tree sends her babies out into the world. The cone is her cradle, or rather a lot of cradles together in a sort of nursery. Each one of the scales of the cone is really a cradle, and while the baby pine is too young to start out for himself Mrs. Pine-tree keeps the doors of her nursery



131. THE PINE-TREE'S NURSERY.

shut by pressing the scales of the cone close together. But when the babies are ready to go she opens the doors and lets them float away on the wind-train. You see one of the cradles at the right of the cone with one of the pine babies still lying in it, and the other outside just ready to go spinning away on the wind. And in the spring you can find plenty of these cones in the pine forests, with all the doors open and the babies all gone.

The ash and the maple, the elm and the pine are all of them great trees, and they are tall enough to lift their babies high up in the air, so that they can go a long distance on the wind before they reach the ground, and get far enough away from their mothers and their brothers to start life in clear places. But how do you suppose the low shrubs and little plants manage with their babies? If you will look at the picture of the dandelion and her babies (132), you can see how one of the plants sends her children out into the world. I am sorry that I could not get a better picture of this plant, but I think you all remember how the dandelion looks, both with its yellow blossom and its white head of seeds. While the yellow blossom is open the stem of the flower is short, keeping it down close to the ground where it will be safe. But as soon as the flower has faded, the stem begins to grow longer and lift the head high up into the air; and at the same time



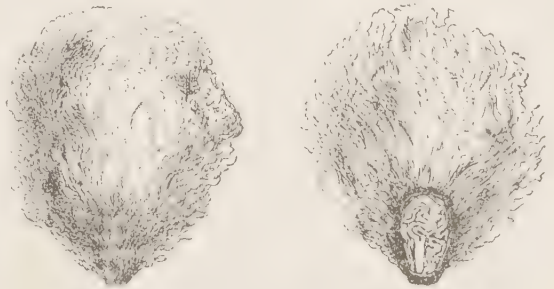
132. THE DANDELION AND HER BABIES.

the top of each tiny seed stretches up into a long, slender hair with a lot of delicate hairs sticking out at the end making something that looks a little like a Japanese paper sunshade without the paper. You see these seeds with their Japanese sunshades on the head of the dandelion at the top of the picture, and at the bottom you can find one of them twice as large as it really is, so that you can see just how it is shaped. It has a sharp point at the lower end with some barbs on the end just above, and when it strikes the ground the point sticks in. And as the wind blows its tiny sunshade back and forth, the barbs catch first on one side and then on the other, and push the little seed further and further into the ground, till at last a stronger gust of wind comes and breaks off the handle of the sunshade and carries it away, but leaves the baby seed safely planted in his new home.

So you see that Mrs. Dandelion gives each one of her babies a sort of Japanese sunshade to spread in the wind. While the weather is damp and cold she keeps the babies snug and dry by wrapping them up in the leaves, that you see hanging down from the head of the flower. But when the weather becomes warm and bright she rolls down the leaves and lifts the head high on its stem and opens all the tiny umbrellas, one for each of her babies. Then the wind comes blowing along and catches up one baby seed after an-

other in its arms and bears them up over the house-tops and the tree-tops, sometimes miles away from the place where their mother lives. Perhaps some of you have picked those round, white heads and blown the baby seeds off. When I was little we used to blow off the dandelion heads to see whether our mothers wanted us, and over in England the children do it to see what time it is. But the wind does it to take the baby dandelions where they can have a good start in life.

Another plant that helps its babies to float away from home is the cotton plant. You see it in the picture of the cotton baby (133). The seed itself is no bigger than an apple seed, and you can see the little plant coiled up in the one that is cut through the middle. If the seed had nothing to help it float, it would fall right to the ground beside its mother and have no room to grow. But the cotton mother gives her child a lot of fine threads puffed out like a ball, so that the wind will catch it up and bear it far away where it will have room to start life all by itself. Those fine, flossy threads are used to make cotton cloth and twine. If you take a piece of cotton wrapping-twine and untwist it and pull off the floss from the end, you can make a ball, light and soft as feathers, that will go sailing away on the breeze, as the seed would if men left it to ripen and fall from the



133. A COTTON BABY, WHOLE AND CUT THROUGH THE MIDDLE.

plant. But instead of doing that, they pick it just before it falls and use the floss to make cloth and thread.

In the last picture of all you can see spiders floating in the air by just the same means that the seeds float. One of these wise little creatures climbs to the top of a post, when the wind is blowing, and turns its head towards the breeze. Then it begins to spin a lot of fine silky threads that stream out on the air, like the threads of the cotton seed. When enough of these threads have been spun to hold the spider, she gives a little





134. SPIDERS SPINNING WINGS.

spring upward from the post and goes floating along the air, till her wind-train brings her to

### SUGGESTIONS TO TEACHERS.

*For Preparation:* Gray's Botany gives an account with illustrations of the organs of seed-dispersion. Tayler in "The Morality and Sagacity of Plants," also has a chapter on the same subject.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read. Bring in some pine cones and some maple seeds, or some other winged seeds, and also some cotton fibers in cotton batten or cotton string, to show the children how the solid mass would fall to the ground, but can be made to float on the wind by spreading it out into thin plates or fibers.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. In teaching these lessons the children will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*Sources of the Illustrations:* The half tone is "Soap Bubbles," by Robert Beyschlag; No. 132 is from Darlington's "American Weeds and Useful Plants," No. 133

some tree or field, where she can find more food than in her old home. Sometimes the warm currents of air, as they rise, sweep her away up into the sky, so that she sails many miles before she sinks down to earth again. But Mother nature takes good care of her and of all the other children. The winds blow them into every nook and corner of the earth, so that the whole world is a garden, filled with the baby seeds growing to feed the insects, and the animals, and the men and women.

*For he shall give His angels charge over thee to keep thee in all thy ways. They shall bear thee up in their hands, lest thou dash thy foot against a stone.*  
—Ps. 91, 11-12.

The winds that o'er my ocean run  
Reach through all heavens beyond the sun,  
Through life and death, through fate, through time,  
Grand breaths of God, they sweep sublime.

Eternal trades, they cannot veer,  
And blowing, teach me how to steer;  
And well for him whose joy, whose care,  
Is but to keep before them fair.

—Wasson.

is from Bocquillon, "La Vie des Plantes," No. 134 is from McCook's "Tenants of an Old Farm," by kind permission of the author.

*Outline of the Course for the Year:* It will be seen by the outline given before that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, "Setting the Table" through the third, "Clothing the Family" through the fourth, "Learning to Walk" through the fifth, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects; or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

#### MOTHER NATURE'S CHILDREN.

- I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.
- II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Fish; 8. Plants.
- III. *Setting the Table.* 9. Birds; 10. Monkeys to Spiders; 11. Insects; 12. Plants.
- IV. *Clothing the Family.* 13. Birds; 14. Animals; 15. Mollusks; 16. Plants.
- V. *Learning to Walk.* 17. In Water. 18. On Land. 19. On Four Feet. 20. On Two Feet.
- VI. *Learning to Fly.* 21. Seeds; 22. Insects; 23. Fish to Lemurs; 24. Birds and Bats.
- VII. *Helping each other.* 25. Men; 26. Beavers; 27. Termites; 28. Flowers.
- VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### VI.

#### LEARNING TO FLY.

##### Part II.—Insects.



#### GETTING WINGS AND LOSING WINGS.

This sweet little baby has been gathering nectar from the flowers, as you can see from the daisies in her hands. But she was so small that her older sister came down with her to see that she did not get into any trouble. And now they are sitting down to rest, and the older sister is showing her little charge something that seems to interest her a great deal more even than the beautiful flowers. I think you can make out what it is that she holds up on her right hand where her sister can see it. It is a butterfly, with large, beautiful wings. I do not know how she got it, but perhaps it came flying down to get some honey out of the flowers in the baby's hands, thinking they were growing there. The butterfly once came to some flowers I was holding and alighted on one of them. I stood perfectly still, and the pretty creature staid quite a while, softly opening and shutting its lovely wings, and at last it went flying away, by fanning the air with its wings, more energetically than while it was on the flower.

How do you suppose it got those wings? It

used to be a caterpillar, you know, and now it is a butterfly that has got wings. In the picture of the caterpillars with wings and without wings (136) you will find both the butterfly, and the caterpillar it came from. That beautiful butterfly in the upper part of the picture was once a caterpillar just like that rough worm on the leaf right below it. If you should take that caterpillar, when he is full-grown, and put him under a glass, you would see him climb up to the top of the glass and fasten himself firmly to it by his hind pair of feet. When he had fastened himself, he would soon begin to shake off that rough-looking outer skin, and in a day or two it would drop off, leaving him just as you see him at the left side of the picture, hanging by the tip of his body, and in a very different shape from the old one of the caterpillar. If you look at him closely, you can make out some short wings, about half as long as his body, but not nearly so long as the butterfly's wings. The creature will hang this way for a few weeks, when suddenly the skin will split along the back and out will come a beautiful butterfly,



whose wings will quickly stretch out to the size you see them in the picture. Then you can lift up the glass that holds him and he will go flying away over the bushes where he used to creep as a butterfly. Let us see if we can understand a little the wonderful way in which he has learned to fly.

You remember that when Mother Nature first began to teach her children to move about, this earth was all covered with water, so that the earl-



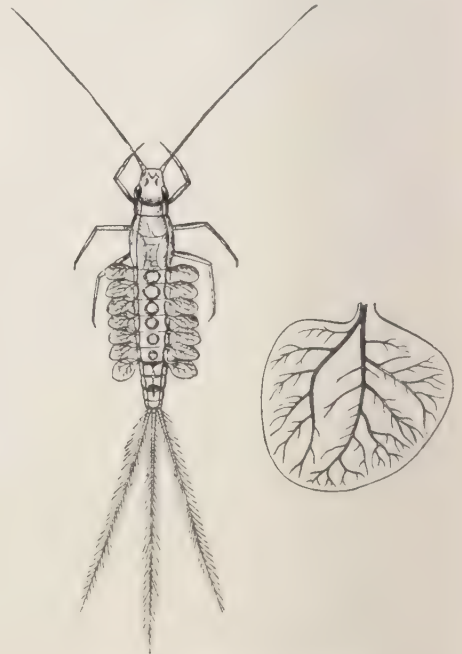
136. CATERPILLARS WITH WINGS AND CATERPILLARS WITHOUT WINGS.

iest babies were water babies, and they got their limbs by paddling about in the water, and their feet by trying to creep and walk on the ground, as fast as the land appeared above the water. So of course the insects that fly now, must have lived in the water once. And if you will look at the picture of water babies getting wings (137) you can see one of the insects that still live most of their life in the water. When they get wings and fly in the air they are called Mayflies. You do not often see them flying about because they do not come out of the water till sunset and they all disappear before the next morning, but you will often find them in great numbers under the street-lights in the morning, even in the heart of the city, as I have here in Chicago. When you find them there you can see their long slender limbs and their four delicate, lace-like wings.



137. A WATER-BABY GETTING WINGS.

But while they are living in the water, instead of wings they have half a dozen thin, leaf-like growths sticking out on each side of their long narrow body. You will notice them in the picture of a water baby magnified (138), only there are seven of them there. One of them has been pictured still larger at the right of the water baby, so that you can see the veins in it. What do you suppose these outgrowth are? They are the lungs of the little creature. When we want to purify our blood we breathe the air into our lungs; but



138. A WATER-BABY MAGNIFIED.

this creature gets along without breathing, by pushing its skin out into the air in thin folds and sending its blood out into those folds, as you see

it in the veins of these leaf-like projections. And the wings of insects are just such leaf-like projections as these, only pushed out farther and moved back and forth, so as to fan the light little creature through the air.

So you see that these flying insects got their wings by trying to fly, just as they got their legs by trying to walk. Long ago, before ever any creature had got wings or learned to fly, some brave and energetic little insect dared to fly for the first time, and she dared to do it because she loved her little ones so much. She had lived all her life in a pool of water that was crowded with insects, so that her babies would have no chance to start in life if they were born there. She must find some better place for them. So when it was time for them to be born she climbed out of the water and in her struggle to get a finer home for them she burst her old skin and stretched her old lungs into wings and fanned herself through the heavy air a short distance till she came to another pool, and there she put her little ones, content to die now that they were safe.

And that is just the way these Mayflies still do to-day. They live in the water a long time,—one or two years,—and then, when their little ones are to be born they come to the top of the water just as the sun is setting. And as they reach the surface of the water their skin suddenly bursts and they come out of it and climb a reed, as you see one of them has done in the picture (137). If you should look closely at the little thing now, you would see that she was quite different from the old water-living insect and that she had wings under her new skin, but that she was not yet a Mayfly. But after drying a few moments, she bursts her new skin and comes out in still another form, that of the real Mayfly with wings complete. Then, when her wings have dried a little and grown stiff enough to bear her, she goes flying about in the evening air; and before long she lays her eggs in some pool, where her babies can grow, and leaves them in Mother Nature's charge. For she herself dies before daybreak and cannot care for them. So you see she has her wings for only a few hours, just to find a new home for her babies, but all her life of a year or more she lives without wings and in the water.

The butterfly has her wings longer than the Mayfly, but she seems to have them for the same purpose,—to find a good home for her babies to start life in. And I suppose she got the wings in the same way, by stretching her lungs and trying

to fan herself through the air, long, long ago, when the air was much thicker than now and therefore easier to fly in. After she succeeded in getting wings, her babies found it much easier for them to get wings, because they took after their mother; till finally the caterpillar could go to sleep a worm and wake up a butterfly,—be born again with wings, just as our own babies are born with feet all shaped for walking, though it took men and women a long, long time to make their feet in the first place. Sometimes the butterflies or the moths lose their wings, because they cease to use them, just as the whale and the manatee lose their feet by ceasing to use them. In the picture of Mrs. Moth without wings (139) you can see



139. MRS. MOTH WITHOUT WINGS AND MR. MOTH WITH WINGS.

how this moth-mother's wings have grown out only a little way; and I suppose it was because she preferred to stay at home and start her babies where she was instead of flying out into the world to find a better place for them, though her husband has full-grown wings so that he can fly wherever he chooses. You can see him in the picture, and below him is the caterpillar from which he came.

Among the ants the father and mother both have wings, though Mrs. Ant's unmarried sisters and daughters, who take care of the babies and do most of the other work, have no wings. The little ants are born without any wings. They are little white worms, something like tiny caterpillars without any legs. They are fed and washed by their grown up sisters, and when they have reached their full size they go to sleep in a chrysalid form, as a caterpillar does, but they do not split open their own chrysalid, like the butterfly. When the time arrives for them to come out of their chrysalid, if you could look down into their underground home you would see three or four of their sisters





140. ANTS WITH WINGS AND ANTS WITHOUT WINGS.

listening beside one of them; and the moment these listeners hear a sound of the stirring ant within, they go right to work, carefully breaking open the skin of the chrysalid and tenderly helping out the young ant, straightening his legs and smoothing out his wings for him.

When there are a lot of these young ants with wings in the nests, some pleasant summer day they swarm out of the holes and fly in clouds through the air. That is their wedding flight and it lasts only a few hours. By the middle of the afternoon you will see young Mrs. Ant flying away

by herself to set up house-keeping in some new place where her children can have a home all to themselves, and not be crowded in the old ant-hill. When she finds a place, she sets at work busily making a hole for them. But she soon feels that her long wings,—such as you see them in the picture of some ants with wings (140),—are a bother to her. She cannot easily move about in the hole. So she bites her wings off and goes without wings the rest of her life, in order that she may be more helpful to her children. She got her wings for the purpose of helping her children to start life in a home by themselves, and now she gives up her wings for those same children. It seems like giving up a great deal to lay aside wings that can carry her through the air so swiftly and so far, but perhaps she is happier down underground with her children than she would be flying in the sky without them, simply because she loves them and loves to be with them and care for them.

To-day I saw the dragon-fly  
Come from the wells where he did lie.  
An inner impulse rent the veil  
Of his old husk: from head to tail  
Come out clear plates of sapphire mail.  
He dried his wings: like gauze they grew,  
Through crofts and pastures wet with dew  
A living flash of light he flew.

—Tennyson.

*He that humbleth himself shall be exalted.*—Lk. 14, 11.

Wisdom is oft-times nearer when we stoop  
Than when we soar.—Wadsworth.

A dim capacity for wings  
Degrades the dress I wear.—Emily Dickinson.

### SUGGESTIONS TO TEACHERS.

*For Preparation:* The dragon-fly and the mosquito are the best known of insects which get wings, and an account of them can be found in any encyclopædia or work on entomology, like those previously mentioned. But I am not aware that the significance of the fact that so many insects get their wings at the end of their lives has been pointed out by anyone before, though it seems obvious enough when once suggested.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read. Bring in some specimens of insects with wings, if possible.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach

through the forms. In teaching these lessons the children will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*Sources of the Illustrations:* The half tone is "Childish Joys," by A. Delobbe; No. 136 is from Brehm's "Thierleben;" No. 137 is from Hess' "Das Aquarium;" No. 138 is from "Campbell's Introduction to the Study of Biology;" No. 139 is from Martin's "Illustrierte Naturgeschichte;" No. 140 is from "A World of Wonders."

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### VI.

#### LEARNING TO FLY.

##### Part III.—Reptiles and Mammals.

#### THAT'S THE WAY.

Just a little every day,  
That's the way!  
Seeds in darkness swell and grow,  
Tiny blades push through the snow,  
Never any flower of May  
Leaps to blossom in a burst;  
Slowly—slowly—at the first,  
That's the way!  
Just a little every day.

Just a little every day,  
That's the way!  
Children learn to read and write,  
Bit by bit, and mite by mite.  
Never any one, I say,  
Leaps to knowledge and its power.  
Slowly—slowly—hour by hour,  
That's the way!  
Just a little every day.

—Ella Wheeler Wilcox.

#### SLIDING ON THE AIR.

These girls are having a gay time sliding on the hard snow. There was a slide something like this, only very much steeper, behind the school-house where I went to school when I was small. And whenever the snow was hard enough we used to slide on our feet down the hill,—unless we lost our balance or caught our foot in some hole. If we did that we used to go rolling down the rest of the way. And sometimes when it was icy we would put on a pair of skates and go sliding down the hill, and the skates would carry us twice as fast and twice as far. But it took a cool head and steady feet to do that. In some countries I believe they have snow-skates made expressly for sliding down the long hills, or the mountains even, when they are covered all over with snow. But the safest and easiest way of sliding on the snow is to use a sled or a toboggan. You can sit down on the sled and get your big brother to steer for you, and you will go flying



down the long hill and away off on the level snow at the foot of the hill. Or if you have two hills, as we did at my home in Maine, you can slide down one hill and half-way up the other, and then walk up the rest of the way and slide back almost to where you started from. And once when I was a boy the snow was so deep and the crust so hard that I slid nearly a mile right over the tops of the fences that divided the fields.

That was very fine, was it not? But would it not be much finer to go sliding on the air instead of on the snow? I don't suppose you would feel brave enough to try to do that. Yet some creatures are brave enough to try to do it, and some of them are cool-headed enough to succeed in



doing it. In the picture of the flying tree-frog (142) you see a bright little fellow who has got some air-skates, as it were, on all four of his feet. He lives in the trees on the island of Borneo.



142. THE FLYING TREE-FROG.

And when he wants to travel about he climbs to the top of a tall tree and jumps out into the air, spreading his fingers and toes, so as to make four kites of them. On these kite-shaped air-shoes he goes sliding down the air, reaching the ground a long distance from the tree from which he started.

The picture of the flying dragon (143) shows you another creature who has learned to slide on the air. This is a lizard, and you can see that he has the feet and tail of the lizards you find here in this part of the country. But besides the feet and tail, you see something along his sides that looks like wings. It is the skin of the lizard, and it is held out by the little creature's ribs. The last six or seven ribs on each side, instead of stopping at the edge of the body, are pushed far out, carrying the skin along with them, and look-



143. THE FLYING DRAGON.

ing something like the ribs of an umbrella. While the little fellow sits motionless on a tree the ribs are bent back close to the body and the skin folded up like a closed umbrella. But the moment an insect comes flying within his reach he suddenly spreads out his ribs and gives a

quick leap and goes flying through the air to catch his food, as you see him doing in the picture, where he has jumped from the branch to seize that fly by the tree-trunk. Sometimes he slides a hundred feet on the air before he stops.

Another creature that slides on the air is the flying lemur that you see in the next picture (144). You will notice that the skin of the one in the corner of the picture stretches from his fore-leg to his hind-leg, and also down to the tip of his tail, making him into a great kite when he spreads out his tail and legs, so that he can go sliding over the air a long way. Mrs. Flying Lemur, who is hanging to the branch of the tree, uses her loose skin as a sort of blanket to hold her baby in. All day long she wraps him up in it and hangs herself from the branch of a tree,



144. THE FLYING LEMURS.

clinging by the long nails of her hind feet. But when it comes night she goes sliding down the air to catch insect food for herself and her baby.

These flying creatures live on the other side of the world, but in our own forests we have a little flying squirrel that has just such loose skin as they have, and uses it to slide on the air in the same way. We do not see him very often, because he sleeps in his hole by day and only comes out after dark. If you should go some summer afternoon into the woods where these flying squirrels live, and should sit down quietly till the sun set and night came on, you would have a chance to see them at their fun. First one little bright-eyed fellow would pop out of the hole in the tree where he had been sleeping, and then another would appear, and another,—till the woods were

all of them, and they would go chasing each other up the trees, as if they were playing tag. And when one of them had chased his mate to the very topmost bough of the tree the squirrel could give a spring out into the air with paws and tail outspread, and go sliding down the air from the tree-top almost to the ground. But the moment when she seemed just going to touch the earth she would bend her body and curve upward from the ground, so that she would come to a stop part way up another tree a hundred feet away from the first one. And her mate would boldly take the same leap and go coasting down the air and up the other tree. But before he could catch her she would have scampered up the tree and jumped again from the top to another tree. And so they would coast back and forth on the air, as we used to coast on the snow, sliding down one hill and part way up the other, and then climbing to the top of the second hill and coasting back again. And they seem to enjoy it just as much as you enjoy coasting, and I suppose it takes a cool head and a brave heart to do so well.

But though they can slide so skillfully they cannot really fly, as the bats can. You see the common English bat in the next picture (145), flying up high in the air. He has stretched his skin out so far that he has made leather wings of it, and can fan himself along through the air very fast. And he has stretched his hands out so



145. THE COMMON ENGLISH BAT.

earnestly in trying to fly that his finger-bones have become about as long as his arms. For if you look closely at the picture you will see that the four ribs of his wings are really the four fingers of his hand, his thumb being that little claw that sticks up at the top point of each wing. In the picture of the vampire (146) you can see the finger-bones still more plainly, and you will notice that this creature has his middle finger

twice as long as his arm, and longer even than his whole body.

But the bat did not get such large wings and learn how to use them so well all at once, I am sure. He got them little by little, and learned to



146. THE VAMPIRE FLYING AND WALKING.

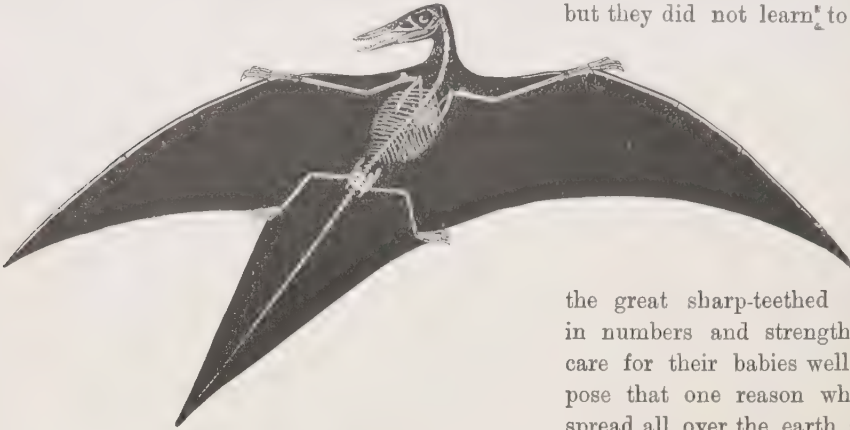
fly little by little, learning to slide first, and then to fly a short distance, and then a longer distance, just a little every day and every life-time, till at last he had larger wings than the squirrel or the lizard, and could actually slide up hill by fanning the air with his wings. But in getting such fine wings the bat lost the use of his hands for anything but flying, as you can see from this same picture, where one of the vampires is trying to walk on the ground. He is very awkward, and no wonder, for he has to walk on the thumb nails of his fore-legs and the weak toes of his hind-legs. So they do not alight on the ground if they can help it. Even when the mother bats have little ones they fly about with them tucked snugly away under their arms. Sometimes when a bat gets caught in a room at night, if you look closely under her arm you will find a baby bat there clinging to its mother's breast, and covered up by the wing as well as by the arm of its mother. The mothers carry them and care for them when they get to be quite large. A boy here in America once caught a young bat, and when he was carrying it home the mother flew round and round him, trying to get it, and at last she alighted on his hands, where he had the little one, and refused to be driven away. She would rather be caught and killed even, than desert her child.

In the last picture (147) you can see the kind of creatures that used to fly all over the earth



long years ago, before there were any men or any horses or cows on the earth. These creatures are

fingers alive anywhere. The wing-fingers got wings quite as good as the wings of the bats, but they did not learn<sup>2</sup> to nurse their babies and



147. THE WING-FINGER FLYING.

called "wing-fingered," because they have such a long finger on each hand to stretch out their wing for flight. It is the little finger and yet it is as long as the whole body. Some of these creatures were as much as twenty feet across from the tip of one wing to the tip of the other, so that their little fingers must have been five or six feet long. They look very much like bats, but they were more like birds or reptiles than like bats, because they did not nurse their babies as the bats do, but probably left them to hatch out from eggs in the sand, as the alligator does.

This greater care that bats have for their babies is the reason we find bats all over the earth now, but do not find any of the wing-

care for them as tenderly as the bat-mothers do. And so the bats grew in numbers and strength because their children were so well cared for, while

the great sharp-teethed wing-fingers grew less in numbers and strength because they did not care for their babies well enough. And I suppose that one reason why human beings have spread all over the earth and conquered all the other creatures in the world is because the human mother cares for her baby more than any other creature cares for its baby; and if the human mothers should stop caring for their babies most, I suppose human beings would soon be surpassed by some other creature that cared more for its babies. If we want our babies to survive and inherit the earth we must make them just as good as we can,—feed them and shelter them and teach them, so that they will know what is right and be strong enough and brave enough to do it.

*The Lord upholdeth all that fall.—Ps. 145, 14.*

What is excellent,  
As God lives, is permanent.—Emerson.

### SUGGESTIONS TO TEACHERS.

*For Preparation:* The best account of the flying squirrel is to be found in Audubon and Bachman's "Quadrupeds of North America," Vol. I., but the encyclopædias will give sufficient descriptions, both of this creature and of bats and pterodactyls, which I have translated into wing-fingers.

*In the Class Room:* Put the pictures in the hands of the children and get them to tell what they see before the description is read.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. In teaching these lessons the children will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also

the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*Sources of the Illustrations:* The half tone is "The Slide," by Hans Dahl; No. 142 is from Martin's "Illustrierte Naturgeschichte;" No. 143 is from Figuiers' "Fish, Reptiles and Birds;" No. 144 is from Figuiers' "Mammals;" Nos. 145 and 146 are from "A World of Wonders," and No. 147 is from Lütkin's "Skildringer af Dyrelivet."

*Outline of the Course for the Year:* It will be seen by the outline given before that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, "Setting the Table" through the third, "Clothing the Family" through the fourth, "Learning to Walk" through the fifth, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

*The happiest man is he who learns from Nature the lesson of worship*—EMERSON.

## Mother Nature's Children.

### VI.

#### LEARNING TO FLY.

##### Part IV.—Birds.



#### SWIMMING THROUGH THE AIR.

This hungry fox had seen these birds resting on the shore of the lake, so he crept up close to them as silently as he could, and then he suddenly sprang upon them. He thought he had surely caught one of them. But he only caught the bird's feathers, which you can still see in his mouth. The bird herself instantly spread her large, strong wings and went flying away through the air with her mates as you can see them doing on the right hand of the picture. Their wings have saved them from this hungry animal. And the wings of birds can carry them over wide rivers and oceans, and even over mountains, hundreds and hundreds of miles, and very rapidly, too, for some of the birds can fly two or three times as fast as a railroad train goes. How have the birds managed to get such fine wings? And how have they learned to use them so well?

Long ago, before there were any birds flying through the air or any dry land even, when the waters covered all the face of the earth, such creatures as you see represented in the next picture (149) were paddling about in the ocean

and learning to lift their heads up higher and higher, because in that way they could catch insects and other food better than the short-necked creatures. And when the dry land came they scrambled out of the water and learned to use their hind feet to stand and walk with, so that their hands and arms were left free.

In the picture of the bird-snake (150), which we have already had, you see how these creatures



149. THE GRANDPARENT OF THE LIZARDS AND THE GREAT-GRANDPARENT OF THE BIRDS.

got up on their hind feet, and even on their hind toes, for the heel of this bird-snake is not on the



ground. It is up as high as where his tail begins, so that he is really walking on his toes.



150. THE BIRD SNAKE.

The grandparents of the birds were like this creature, only they had feathers on their body where he has scales, and their arms were long and strong while his are short and weak. I suppose they got their better arms by working harder in climbing the trees to escape from savage

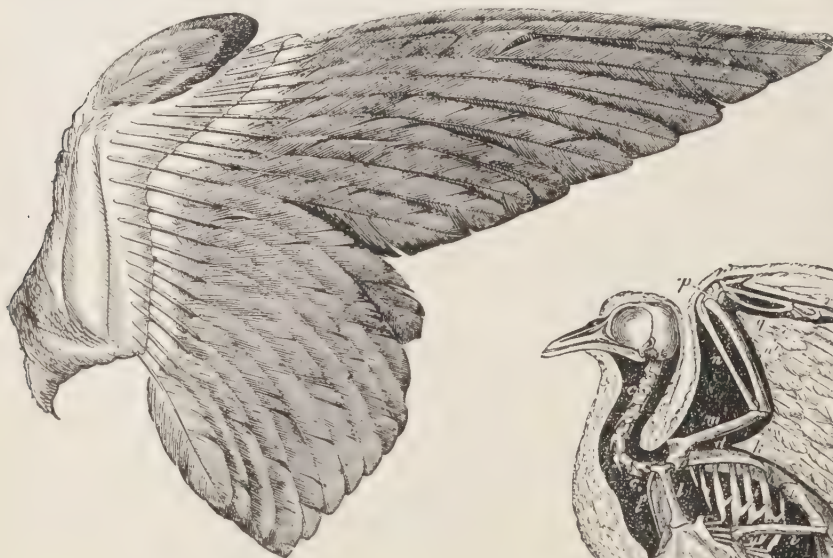
make themselves lighter, Mother Nature changed the scales little by little into feathers. She is so kind to her children that if they wish to stay in the water or mud, she gives them scales that will protect them and allow the mud to be easily washed off. But if they are brave and loving enough to come out upon the ground and nurse their little ones, she gives them hair instead of scales. And so if they are daring enough to try to live in the air, she gives them feathers—so soft and light and yet so long and strong.

You can see some of those light, yet long and strong feathers in the picture of the bird's wing (151). That is really the bird's arm, and the feathers are growing out of the skin of the arm.

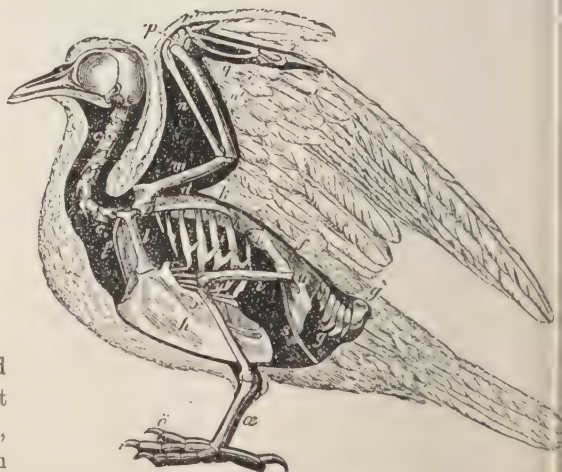
In the picture of the dove in three parts (152), you can see the bones of the arm raised above the dove's body. The black part of this picture shows you the dove's body and the lighter colored part outside represents the feathers, while the lighter part inside represents the bones.

If you look carefully at the dove's wing you will notice that the wrist,—marked "p,"—is just above the dove's head, and the hand, which is also covered with long feathers, is folded back. When the hand and arm are straightened out, the long wide feathers are spread out into the air like

an open fan, and make a long wing with the edge of the feathers overlapping one another. If you watch your canary bird when he stretches his wings you will see



151. A BIRD'S WING.



152. A DOVE IN THREE PARTS.

animals and to get better food for themselves and their children; and I think they must have got their feathers by trying to slide through the air, as the flying squirrels and reptiles do. When they tried to spread out their scales in order to

How long he can make them. You can see how large they are and how fast they move in the pictures of the heron flying (153). It looks as if there were five birds in this picture, but there is really only one bird pictured five times. A Frenchman who wished to know how the birds used their wings in flying, made a camera that would take ten pictures every second, or six hundred every minute. The camera was shaped like a gun and he aimed it at a flying bird, but he did not shoot the bird. He only took one picture after another so quickly that the five pictures you see were taken in just one-half a second and show how the bird moved her wings during that short time. The first picture you see, beginning on the left, shows the wings spread downward and in front of the bird. In the next the wings have gone part way up, and in the third picture they are stretched up to their highest and widest extent. Then in the fourth picture they are coming down, and in the fifth they are just where they were at starting. But during this half second the bird has moved forward five or six times her length. She keeps up this swift motion up and down one hundred and twenty times a minute,—almost as fast as you can count,—and fans herself forward sometimes two or three miles a minute.

But of course the birds did not get their fine feathers and swift wings all at once. There was



153. FIVE PICTURES OF A HERON FLYING.

time when they had long tails on their bodies and sharp claws on their hands and teeth in their mouths, as you see in the picture of the ancient bird (154), where the teeth can still be seen in the bill, and two claws at the middle of the upper side of the wings. But Mother Nature soon taught them to fly so well that they no longer needed claws on their hands for climbing; and she taught them to steer themselves by long feathers instead of using that heavy, clumsy tail, and she helped them to pack the useless bones of their old tail together, as you see them in the tail



154. THE ANCIENT BIRDS.

of the dove (152, g). She showed them, too, that they could build their nests and feed their little ones a great deal better without any sharp teeth in their bills. So she helped them to change their mouth into that of the dove. But when they had lost their hands they learned to use their toes for holding things, and sometimes the bird-mother will take one of her little ones in her claws and fly away through the air with it and carry it to a place of safety.

But perhaps the finest thing that Mother Nature taught her feathered children to do with their wings was to fly away to the sunny south when the cold winter came in the northern lands. You see the swallows gathering for their flight in the picture (155). The summer leaves have fallen, the sky is dark with storm clouds, and so

the swallows know that the winter is at hand. So they gather in great flocks, sweeping through the air or perching on the trees or buildings and chattering in their cheerful, excited way, as if they were all talking at once about their trip. In a day or two they have all disappeared, and while we are shivering in the winter's cold, where do you suppose they are? Mother Nature has guided them to the southern countries a thousand miles away.

And when the spring returns she will lead them back again, so that they will escape the





155. THE SWALLOWS GATHERING FOR THEIR FALL TRIP.

parching heat of the southern summer as well as the freezing cold of the northern winter. And about this long flight they must have learned little by little, like every thing else. At first when winter came, they flew only a few miles south to find better food and warmer air, and then when spring came they flew back north to their old homes again. But they found the food and climate so much better by going south in winter and north in summer, that they flew farther and farther each year, till now they will go over wide oceans, even, and high mountains each spring and fall, and nothing can keep them from starting when the time comes. Only their little ones will sometimes hold them back.

A man in England one fall noticed one pair of swallows linger about their nest long after all the rest had flown away. So he climbed up and looked into the nest to see what kept them. And there he found one of their children with its foot caught fast in a hair of the nest, so that it could not get away. He thought he would leave it

#### SUGGESTIONS TO TEACHERS.

*For Preparation:* The best account of flight is to be found in "Animal Mechanism" and "Movement," both by Marey and published in the International Scientific Series. Chambers' Encyclopædia, under "Flight," has a brief account but clear and good. The article in the Encyclopædia Britannica is not to be commended. "The Grandparent of the Lizards" is

there to see how long the parents would stay and feed it, and so he let it stay till Christmas. But it grew so cold then that he took pity on the birds and cut the hair. And then all three went flying away from the cold north to the sunny south, changing winter for summer, as the other birds had already done. Perhaps they pitied the human beings they left behind them in the cold country, and it may be that they thought that they were themselves the most favored of all Mother Nature's children. Certainly they seem the happiest—so happy, indeed, that their gladness overflows in the flood of song that comes rippling from their tiny breasts. And I suppose their joy comes from the fact that they have dared to do the boldest and hardest thing that they could see to do. Mother Nature urged them to go higher and higher—out of the water and out of the mud, up from the ground to the trees and up from the trees to the sky itself—and they took every upward step they could see to take, and grew safer and happier with each new step.

But I think human beings have taken a higher and nobler step even than flying. When we choose to think about this world of ours and try to help make it better, we tried to do a bolder deed than flying with feathered wings. We tried to fly with our brains, to send our thoughts down the past and learn how this world was made, so that we might understand it and be able to make it better in the future. We have tried to send our thoughts flying to the moon and the sun and the stars, in order to understand them. And that is a far higher flight than any bird has dared. So we ought to be as happy as the birds, if we are only willing to take all the new and higher steps we see to be taken with our brain—to try to help the whole world to live nobler and purer and more loving lives. And we have hands to work with, while the birds have lost their hands in getting their wings.

*They that wait upon the Lord shall renew their strength; they shall mount up with wings as eagles; they shall run and not be weary; and they shall walk and not faint.—Is. 40, 31.*

Here sits he, shaping wings to fly.—Tennyson.

the plesiosaurus.

*Sources of the Illustrations:* The half tone is "There's Many a Slip," by J. S. Noble; No. 149 is from Sterne's "Werden und Vergehen;" No. 152 is from Lutkin's "Dyrelivet;" No. 153 is from Chambers' Encyclopædia; No. 154 is from Buckley's "Winners in Life's Race;" and No. 155 is from Michelet's "Bird."

*The happiest man is he who learns from Nature the lesson of worship*—EMERSON.

## Mother Nature's Children.

### VII.

#### HELPING EACH OTHER.

##### Part I.—The Early Family.



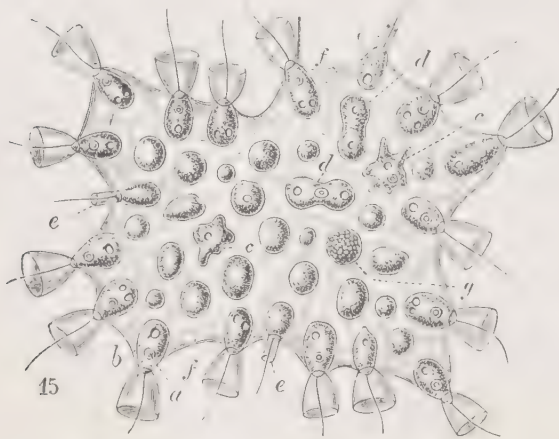
#### TAKING HOLD OF HANDS.

"Ring-a-Ring-a-Rounder" is what the painter of this picture calls it. I suppose that was the name those merry little children were playing. I am not sure that I know just what game it is, but I am sure that all of you have played such games as this, where we all take hold of hands and sing and march or dance around, and I am sure you were all of you a great deal happier doing that than you would have been trying to have a good time all alone by yourself. In order to be as happy as those children are we need some help from others. One child cannot play "Ring-a-Ring-a-Rounder" all by himself. He must get some others to help him. Then he can be happy, and he will find that he is helping them to be happy, too, if he does all he can to play fair and be gentle and kind and loving. And I think he will find he is happier himself when he tries to help others to be happy than when he is trying to have them help him to be happy.

And this happiness which comes from helping others is what Mother Nature uses to coax all her

children to take hold of hands and help each other, as the children in the picture are doing. She makes us happy when we help others, so that we will want to help others all we can; because it is only by helping others that men can do much in this world. And when Mother Nature began with this world she did not have any children so large as men and women, or even so large as girls and boys. Her largest children were like the tiny monads with which she began when she tried to teach living beings how to walk and fly. Those monads were so small, you remember, that we could hardly see them, except when they lighted up the ocean at night. And of course such tiny creatures would need to take hold of hands even more than we do to accomplish anything. If you will look at the picture of the grandparents of the sponge (157), you will see how they began to take hold of hands and help each other. Each one of those little black spots represent a tiny creature, who can live all by himself if he wants to. If you should take a drop of water in which hay had been soaking, and look at





157. THE GRANDPARENTS OF THE SPONGE.

it through a microscope you might see one of these little fellows all by himself, with his collar around his neck and his tongue sticking out to sweep in any food he might find. And if you should watch him long enough you might see him grow larger and larger, until he was big enough for two. Then he would divide himself in the middle and you would see two creatures, each with his own collar and his own tongue. But instead of each of these little fellows going away to play by himself alone, as the monads do, you would find that they would stay together, and they would look as if there was a drop of mucilage or jelly holding them. And each of these would divide into two more, and these into still more, while the jelly-drop would also keep growing, till you would have something like what the picture shows you,—a whole cluster of little creatures living together in a drop of jelly. You will notice that the outside ones alone have tongues and collars. They get the food for all of them, while some of the others digest the food and make more of the jelly-like matter they are living in, and the rest grow and divide, as you see some of them doing in the centre (those marked “d”), and so make new members of the family,—babies that grow up and creep out to the edge, get collars and tongues and help the rest; while those who have been on the edge sometimes take off their collars and pull in their tongues and go into the center, as those marked “e” seem to be doing.

That is the way these tiny creatures take hold of hands and play their little game of helping each other, some of them getting food while others are resting or are caring for the babies. And all of them are safer than they would be alone, because by helping each other they can build up a house for themselves. The sponge you have had

in your hands so often was the home of tiny creatures like these. It starts with one little being, dividing himself again and again till he becomes a great family of creatures. And the family settles on a rock at the bottom of the sea and spins fine fibers to make a safe house for the millions of little creatures that live together in it. No one of the tiny creatures, by himself alone, could have built up such a large house. But even if he could have done it, just think how lonesome he would have been in it, like one little child in a great house. But with the millions of little ones crowding the sponge and helping each other from morning till night, what a happy time they must have?

In the picture of the family of Hydras (158), you can see another way that Mother Nature has

taught her children to help each other. Some of the family, or colony, as they call it, have grown up high and got long fingers, which they stretch out into the water after food for the family. Those are the ones marked “a,” while the shorter ones, marked “b,” take care of the babies; and at the



158. A HYDRA FAMILY.

bottom the thorn-like things, marked “c,” are the ones that protect both of the other two. When a dangerous fish comes swimming along and tries to eat up the taller members of the family they bend down and lie flat among their shorter brothers, who bristle up so hard and sharp above them, that the fish has to go somewhere else for his dinner, and when he is gone the taller brothers and sisters rise up again and go on looking after the food and the children. These little creatures find it so much pleasanter living together than apart, that they never separate, as the sponge-grandparents of the sponges sometimes do, and they have lived together so long helping each other in this way that they cannot change. The sponge-grandparents could take off their collars whenever they wished to, and then put them on again. But the hydra food-seekers cannot change to baby-tenders, nor can the baby-tenders change to food-seekers. Nor can either of them change into the thorn-like protectors. They have divided the work of the family up between them, and one does all

of the protecting, another all of the feeding, and another all of the caring for the children. And they have taken different shapes, so that they can do their different kinds of work better than they could if they stayed like the grandparent of the sponge.

The plants, too, have learned how to help each other by dividing their work up and each one doing something for all the rest. There are



159. A PEA FAMILY.

some plants that are like the monads. Each one is a tiny baby living all by itself and not taking hold of the hands of any other baby-plant,—something as if one little leaf on a tree should go away by itself instead of joining hands with all the rest of the leaves to build up a tree for a home to live in. Such plants have never learned how much happier and safer and stronger they would be by joining hands and helping each other. But the pea has learned that lesson. In the picture of the pea-family (159), you see how a part of the family push down into the ground and reach

out for the food for all the family, while others of the family climb up into the air and make themselves into leaves to do the breathing and get the sunlight for all of the plant. They breathe for the roots and the roots suck in food for the leaves. In the game the pea-children play, the leaves dance in the air and sunlight, while the roots do their dancing down in the dark ground; but I suppose they are all happy because they are all helping.

And you will notice that there are some tiny tendrils just starting out above the leaves. Those tendrils are really leaves that have changed themselves into twining fingers to take hold of sticks or strings to help raise up the rest of the plant where the leaves can get air and sun, as you will see if you look at the next picture of the pea-leaf grown up (160), where you will see the upper part of the many-bladed leaf has round fingers instead of flat blades. If you should stand beside such a

growing pea and hold your pencil out against the tendril, you would see the finger bend around the pencil and clasp it tight in a few minutes, and begin to pull the plant up towards it, something



160. A PEA LEAF WITH FINGER TIPS.

as a little baby's fingers would clasp the pencil and pull himself towards it. And many of the plants will reach up their tendrils above the head of the plant and move them around in a circle to try to find something to take hold of.

In the picture of the fingers of the Virginia creeper (161), you see another way that the leaf changes itself into tendrils and holds up the plant. In the upper part of the picture the tendril is reaching its fingers out to find something to take hold of, and in the lower part, you see it after the fingers have found the smooth boards of a house to cling to. Five of the fingers have pushed their tips against the boards and had something like nails grow out and stick fast to the boards, so that you can hardly pull them loose. You will notice, too, how the fingers have grown thicker, and twisted into sort of springs, so that the hardest wind that blows cannot blow the vine down. If you count the tendrils in the upper part of the picture, where they are new, you will find there are eight, while there are only five on the lower part where it is old. What do you suppose has



become of the three missing tendrils? They withered away and dropped off because they did not find any place to take hold and help the

rest of the plant, while she lets the unhelping ones die.

So you see that the tendrils and leaves above and the roots below are all working together to build up the vine. And on a great tree, like an oak or a maple, all the hundreds of leaflets and all the hundreds of rootlets are working together and helping each other to make the great tree tall and straight, just as the millions of little beings are working together to build up the sponge. Who do you suppose tells the little creatures how to make the sponge, or the vine, or the tree? Who plans it for them and tells the leaves what to do for the roots and the roots what to do for the leaves? Who tells them both how to shape the tree and build in the fiber of hard wood and of soft bark? Somebody must be looking out for them all and whispering to each one of them the right thing to do to help the others and to help the whole world, as the sponges, and vines, and trees do. And when they do not listen to that voice that whispers to them, they are unhappy and pine away, and die, or the tendrils do. But when they listen and obey they are happy and grow stronger and better.

*Behold how good and how pleasant it is for brethren to dwell together in unity.—Ps. 133, 1.*

Ever fresh the broad creation,  
A divine improvisation,  
From the heart of God proceeds,  
A single will, a million deeds.

—Emerson, *Woodnotes*.



161. THE VIRGINIA CREEPER'S FINGERS.

plant, while the five that took hold grew larger and stronger and lasted for years. Mother Nature helps those to grow and live who help the

### SUGGESTIONS TO TEACHERS.

*For Preparation:* The Encyclopædia Britannica treats of the lowest forms of life under "Protozoa" and "Schizomycetes." "The Psychic Life of Micro-Organisms," by Binch, is written in a clear and popular style. Any recent work on Natural History or Biology would touch on the subjects.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read. Bring a sponge for them to see to make it real.

*Sources of the Illustrations:* The half-tone is by F. Dvöřak; No. 157 is from Kent's "Manual of the Infusoria;" No. 158, from Thomson's "Study of Animal Life;" No. 160 from Bocquillon's "la Vie Les Plantes;" No. 161, from Darwin's "Movements and Habits of Climbing Plants."

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### MOTHER NATURE'S CHILDREN.

I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.

II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Fish; 8. Plants.

III. *Setting the Table.* 9. Birds; 10. Monkeys to Spiders; 11. Insects; 12. Plants.

IV. *Clothing the Family.* 13. Birds; 14. Animals; 15. Mollusks; 16. Plants.

V. *Learning to Walk.* 17. In Water. 18. On Land. 19. On Four Feet. 20. On Two Feet.

VI. *Learning to Fly.* 21. Seeds; 22. Insects; 23. Fish to Lemurs; 24. Birds and Bats.

VII. *Helping each other.* 25. Men; 26. Beavers; 27. Termites; 28. Flowers.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

# Mother Nature's Children.

## VII.

### HELPING EACH OTHER.

#### Part II.—The Sister Family.

#### THE SONG OF THE BEE.

Buzz-z-z-z-z-z, buzz!  
This is the song of the bee,  
And a very great worker is she.  
The sweet-smelling clover  
She, humming, hangs over;  
The scent of the roses

Makes fragrant her wings.  
She never gets lazy:  
From the thistle and daisy,  
And weeds of the meadow,  
Some treasure she brings.  
From morning's first gray light  
Till fading of daylight,  
She's singing and toiling

The summerday through.  
Oh, we may get weary  
And think work is dreary;  
'T is harder by far  
Having nothing to do.

—Marian Douglas

#### THE OLDER SISTER.

The older sister is helping her younger sister to dress in the morning, and the younger sister seems to like it very much indeed, if we can tell by the way she looks into her sister's face and hugs her sister's arm. And the older sister seems to think it is very pleasant, too. She likes to be a sort of little mother to her sister, while her own mother is taking care of the baby. In that way she can help pay her mother for the care she gave her when she was herself a baby. And even when she did not remember the care she had when she was small, she loves her mother so much that she would like to do anything to save her mother work. I think, too, that she loves her sister so much that she enjoys helping her and is happier when she is working for her sister than when she is working for herself.

I have sometimes seen older sisters whose whole life seemed devoted to their younger sister.

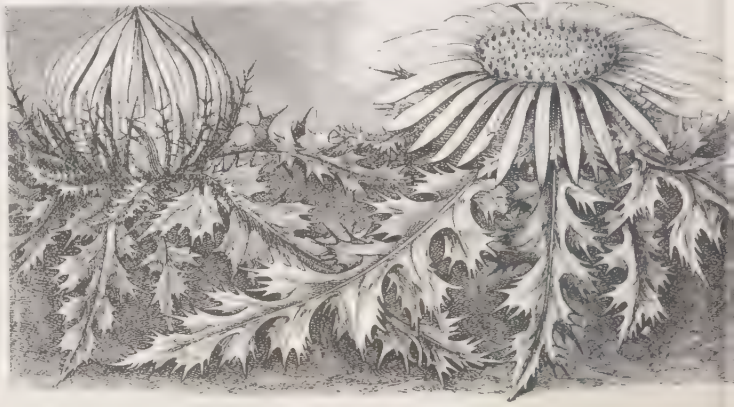


You can see some of those older sisters among the plants in the picture of the daisy (163). All of the broad white leaves circling the dark center of the daisy,—the petals, as we sometimes call them,—are the older sisters of a little daisy family. The flowers of the daisies, instead of scattering themselves all over the plant, get close together on one spot. A hundred tiny baby daisies snuggle together inside of what we call one daisy flower. If you should cut a daisy into two halves and look closely at it you would see

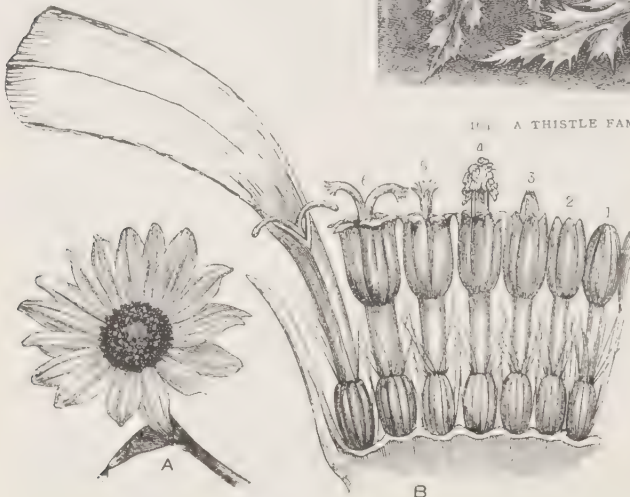


the separate blossoms, and if you should use a magnifying glass the flower would appear like the piece of one of the flowers you see at the right hand of the daisy,—marked "B." In that you can see seven of the baby blossoms, each separate but all standing close together on the same stalk. And you can see that the outside flower has a long, leaf-like petal, which is called a ray. Each of the outside flowers has such a ray as that, and all of the rays make the white rim of the daisy. These outside baby daisies are the oldest of the family, while those in the center are the youngest. You

sisters of that flower make for the baby blossoms at night or in rainy weather. The tent is on the left and on the right you see the flower when the older sisters have let their younger sisters go out into the sunshine. Only the older sisters of the thistle are not flowers, but leaves that give their



164. A THISTLE FAMILY AT NIGHT, AND A THISTLE FAMILY BY DAY.



163. A DAISY, AND PART OF A DAISY FAMILY MAGNIFIED.

can see in the picture that the tiny blossom numbered "1," is not even open yet, while the next one, numbered "2," is only just opening. But the outside blossom, No. 7, is opened widest of all. Like the oldest sister in the human family, she helps take care of the rest of the children.

When the weather threatens rain or when night comes, the fifteen or twenty oldest sisters who stand outside bend their white rays up over their younger sisters and so make a little white tent for them to keep the little ones dry and warm. When morning comes or the rain clears off, they fold their rays back again, so that their younger sisters can enjoy the sunshine. They put their baby sisters to bed each night and tuck them in out of the cold and wet, and they watch over them all day long. In the next picture (164) of the thistle, you can see the tiny tent which the older

whole life to helping the mother plant care for the great family of babies. The plants that gather their babies into bands, where the older sisters can look after the younger ones, and all of them can help each other, are the most successful plants in the world. There are more of this family than of any other, and I imagine that they are more happy than any other, because they help each other.

Some of the insects, too, have learned to help each other, and the older sisters have learned to help the mother in caring for the family. In



165. A BEE CARING FOR HER YOUNGER SISTERS.

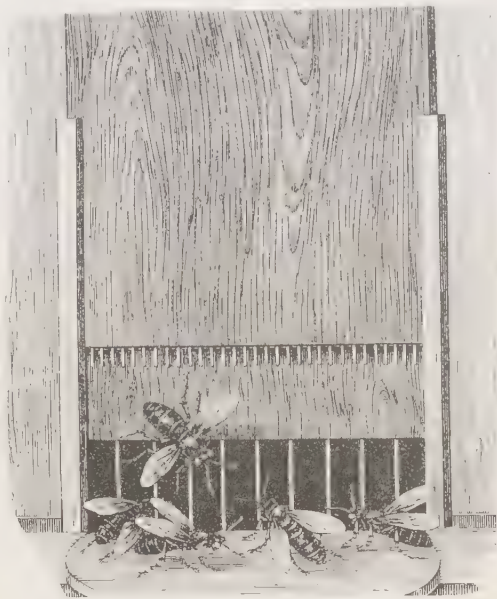
the picture (165) of the bee-sisters, you see the older sister with wings helping to care for her half dozen younger sisters who have not yet got their wings. The youngest of the sisters—the one at the top—is only a tiny egg, which the bee-mother has laid in the cell. That egg-laying is all the mother does. The sisters do all the rest of the work. They feed the egg when it hatches into a little white worm and grows larger and larger and hungrier and hungrier. In an ordinary bee hive

There are thousands of baby bees needing to be fed very often, so you see the older sisters are very busy nursing their younger sisters.

But besides this nursing they have to build the thousands of beautiful white cradles for the babies to lie in while they are growing into bees with legs and wings. And they have to go out through the fields hunting for honey and pollen among the flowers. Of course one older sister could not do all these different things. So they divide the work up between them. Some of them hunt for honey, others build the cells or cradles, and others feed the babies. And there are still others that stand and make their wings go fast to fan fresh air through the hive so that the babies and nurses will not stifle or the wax cradles melt on hot days. And some of them, too, are watching at the entrance, as you see them in the picture (166), so that no one shall come in to hurt the babies or steal their food. If you should drop a caterpillar down on the board at the door of the hive, you would see the guarding bees all start up and move about hastily and gather around the caterpillar. And the caterpillar would have to creep away at a pretty lively rate not to get stung and pushed off the board by the bees. And if you push a piece of straw, five or six inches long, into the door, the bees on guard would at once begin to look at it and feel of it and try to pull it out of the doorway. At last they would get it loose and one of them would clasp her arms about it and fly away with it till she got forty or fifty feet from the hive, when she would drop it and come back again to guard the door.

And if you could watch one of the sisters that was hunting for honey, you would find that she was up and at work before you had your breakfast, and that she was busy all day long, hurrying from flower to flower, to get the sweet juice and the yellow dust and flying straight back to the hive with her load, and handing it over quickly to her sisters in the hive and starting out again at once for more honey and pollen. So the bee hive is a great, busy family, with one mother and thousands of daughters who do all they can to help their mother and each other. And I suppose it is because the daughters do all they can to help their mother and each other that the bee family is so large and strong and the bees seem so happy. And if the brothers helped as much as the sisters do, I think the family would be still larger and stronger and happier. But the bro-

thers do not help at all in the work of the hive. They are the "drones" who only eat and sleep through the summer, and when the cold weather comes their hard-working sisters drive them out of the hive to die of cold and hunger. I suppose



166. BEE SISTERS ON GUARD AT THEIR DOOR.

Mother Nature tells the sisters to do it, and I think it serves the drones right. If they want to be safe and happy they must help the others.

The ants are the cousins of the bees, and like them they have learned to help each other. Some of the sisters in the ant family nurse the baby ants and others build the ant-hills or guard the doors or go off in search of food. And when they are hunting for food they will sometimes help each other by the larger sisters marching on the outside of the line and doing all the fighting, while the smaller sisters march in the center of the line and carry the food. And when they come to a stream which they wish to cross, the large ants will find a tree whose branches reach over to the other side of the stream. Then they make a bridge of themselves, by having one ant hang down from the end of the branch, and another hang down from her feet and a third from the feet of the second, and so on till the string of ants reaches the water or the other bank, as you see it in the picture of the ants helping each other to make a bridge and tunnel (167), where a line of ants hang from the end of the branch to the water's edge.

In the same picture you see the tunnel the



ants have built to keep off the heat of the sun. The smallest sisters of this ant family are killed by being in the hot sunlight of Africa for a few minutes. So when they have to go out by day



167. ANT SISTERS CROSSING A RIVER, AND BUILDING A TUNNEL.

they keep in the shade all they can by going under logs and stones and leaves. But if they have to cross an open plain like the sandy shore in the picture, the larger sisters who are not hurt by the sun, build an arched tunnel for their sisters to go under, made of their own bodies, held together by clasping each others hands and feet. If the space is too long for this, they build a tunnel of sand, as you see in the picture, sticking the

grains together so as to form a safe covered way for their smaller sisters. And the ants in this country will make such a covered way to reach the little aphids,—the ant-cows,—which they keep on the trees. They will build the covered way along the ground and up the trunk of the tree, so that the birds cannot get at them, as they go for their milk, and they will even build a clay roof over the Aphids,—a sort of cow shed,—so that no one else shall milk their cows. But most ants prefer to dig under the ground instead of making a tunnel over it, and sometimes they will make a tunnel under a river twice as wide as the Chicago river, just to get at food beyond the water. All of the sisters take hold and help each other and by so doing they can accomplish almost anything. And they have learned to do these things by living together and helping each other; so that some scientific men think that next to human beings the ants are the wisest creatures living on the earth. They have listened to Mother Nature's teaching better than any other creatures except men, and she has helped them just as far as they have minded her.

*Many daughters have done virtuously, but thou excellest them all.*—Prov. 31, 29.

For Nature listens in the rose  
And hearkens in the berry's bell,  
To help her friends, to harm her foes,  
And like wise God she judges well.  
—Emerson, *Nature*.

### SUGGESTIONS TO TEACHERS.

*For Preparation:* A good statement in English of Social Life from the evolutionary point of view is to be found in Thomson's "Study of Animal Life." Besides Taylor's "Morality and Sagacity of Plants," Geddes, "Chapters in Modern Botany" is helpful.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read. Bring in some composite flower for them to see to make it real.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. Give them no more of body than shows soul, as Browning says of painting.

In teaching these lessons thus to the children they will doubtless get ideas of nature that are too narrow

and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and will" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*Sources of the Illustrations:* The half-tone is "Arising," by E. Munier. No. 163 is from Cheshire's "Bees and Bee-Keeping," slightly extended; No. 164 is from Kerner's "Natural History of Plants;" No. 165 is from Jones' "Natural History of Animals;" No. 166 is from Figuier's "Insect World," and No. 167 is from Wood's "Homes without Hands," and represents the work of the Driver Ants of Africa. I have taken the liberty of changing the gender of the bee in Marion Douglas' pretty poem.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### VII.

#### HELPING EACH OTHER.

##### Part III.—Flocks and Herds.



#### THE OLDER BROTHERS.

"Off to America" is the name of this picture. Of course these children are not really going to America in that little boat, for they live in France, so that they would have to cross the wide ocean to reach America. But they have often seen their friends go on board the great steamers and sail out over the ocean to go to America, and so they have taken their dolls and got into the little boat and are pretending that they are "off to America." But I don't believe they would have felt brave enough to start out on the water so, if they had not had their older brother,—or some one's older brother,—with them to push the boat from the shore and manage that funny little sail: and I think they would be a great deal safer if that brother was still older, or if they had their mother along with them. If they were really going over the vast ocean they would need a big vessel or steamboat and a great many fathers and older brothers to manage it, unless they wanted to get tipped over by the big waves and drowned in the deep water.

And the fathers and the older brothers have learned to protect the mothers with the babies and the younger sisters among the animals as well as among human beings. The animals gather in flocks and herds with the fathers and brothers on the outside and the mothers and sisters in the center, and then the mothers and little ones are safe. Even the timid sheep can keep dogs and wolves off in this way. When the sheep are living all by themselves without any shepherd to take care of them, they stay in small flocks, and have one of the fathers or brothers stand on guard, watching for a wolf or any other dangerous animal. The moment the sentinel sheep sees such a dangerous animal he stamps his feet and gives a sort of whistle, and all of the sheep run together into a circle with the mothers and sisters inside and the older brothers and the fathers on the outside. And these older brothers have such large, strong horns and strike so hard with them that no wolf dares to come near enough to get hit. The only way the wolf can catch a sheep is by watching till one of them strays a little from



the flock, and then rushing upon it and carrying it off before the fathers and older brothers can get to it to protect it. So the sheep all stick very



169. A PACK OF WOLVES HUNTING A BUFFALO.

close to each other when they are nibbling the grass and when they are lying down to rest.

And larger animals, like the buffaloes, protect themselves in the same way. They form a large herd, having the sisters and babies inside and the older brothers outside, with their shaggy heads and long horns directed towards the dangerous animals. The wolves do not dare to attack them then, because the buffaloes will rush at them and toss them in the air with their horns and often kill them. To get a buffalo the wolves have to do just as they do with the sheep,—watch till they can find one at a distance from the herd. But even then the wolves have to help each other; for the buffalo is too strong for one or two of them. So when they find a buffalo that has strayed from the herd, a lot of them gather around him, as you see them in the picture (169), and some of them will attack him in front and others will come up behind, till they tire him out. Then they will rush in all together and drag him to the ground. But the man who drew this picture rode up to the wolves and drove them away from the buffalo, so that he went galloping off to try to get to his herd where he would be safe.

In the next picture (170), you can see the way the elk help each other to keep the wolves off in winter. These large deer have no fear of the wolves in the summer, because they can easily outrun them, or toss them off by their antlers. But when winter comes and the ground is covered with snow, the deer sink deep in the snow, so that they can neither run nor use their horns. Then they gather together in herds and tread the snow down, making an “elk-yard,” as it is called, where the sisters and mothers can be safe on the

hard snow or the ground in the center. At the bottom of the picture you see a hungry wolf looking into the yard and one of the older brothers of the herd looking out at him. And you can see other deer lying down in the middle of the yard, and at the top of the picture are more hungry wolves looking into the yard from the other side. But the deer do not fear even a whole pack of wolves, because they can help each other in keeping them off.

The monkeys, too, have learned to help each other. When an eagle tries to carry one of them off, all the rest of them rush to his help and beat the bird and pull its feathers out, so that it is glad to let go its hold on the monkey and fly away. And when they have to travel from one place to another and have to cross a river, they will make a chain by taking hold of



170. THE ELK-YARD.

hands, something as the ants do, only it is the big brothers instead of the big sisters who make the monkey-bridge. They climb a tree that overhangs the water, as you see them in the picture (171), and then they hang down from one another

till they have a string of monkeys long enough to reach across the water. Then they swing back and forth till the monkey at the end of the string can catch hold of a branch on the other side of the stream and hold fast. After that the sisters and the babies walk over this live suspension bridge, and sometimes the roguish little monkeys will slyly pinch or slap their elders, who are holding fast in the bridge, so that they cannot punish them for it. When the sisters and babies have all crossed over, the first monkey lets go his hold on the tree while the other monkeys hold fast and pull him and all the rest of the bridge across the river.

And when the monkeys are attacked by dogs the fathers and the elder brothers will face the



172. THE SOCIABLE WEAVER BIRDS' HOME.

can reach some safe place. A German traveller, who spent his life studying animals, tells us that once when the dogs rushed at the monkeys and were kept off by the older brothers, one of the youngsters among the monkeys got somehow separated from the rest and climbed a rock, where he was surrounded by all of the dogs, barking and jumping at the poor little fellow. But when the other monkeys saw him, one of them,—I don't know whether it was his father or his oldest brother,—left the rest of the band of monkeys and came alone down among the dogs to help the little one. And he looked so brave and threatening, as he came, that the dogs were afraid to touch him and slunk back, so that he could go straight to the rock, where he coaxed the little one down and carried him safely up the hill to the rest of the monkeys. That was a pretty good sort of a big brother to have, even if it was a monkey.



171. MONKEYS MAKING A LIVE BRIDGE.

dogs and roar at them so loud as to frighten the dogs and keep them off, till the sisters and babies

The birds, too, have learned to be safer and happier by helping each other. In the picture of the sociable weaver birds home (172), you can see what a large house they build, when they work together. That great pile of hay, stacked up in the tree, was gathered by the birds and put into place, one blade at a time. A single pair of birds could not do it, but two or three hundred pairs working together can do it easily. Each one of the hundreds of pairs has its own nest under this roof, which keeps off the hot sun by day and makes a warm shelter at night. You can see the different nests at the left side of the picture. The roof also protects them from the monkeys



and other hungry creatures who would like to steal their eggs and babies. And when there are so many birds together there will always be dozens of them at home to join in defending their



173. CROWS DRIVING AN OWL AWAY.

house against such dangerous creatures. So they are a great deal safer, just as the swallows are who gather in crowds to build their nests in the same barn. When any creature tries to hurt any one of them, all the rest come to the protection of that one. The English sparrows will sometimes steal a nest that the swallows have made, by taking possession of it as soon as it is finished and holding it. One pair of swallows is no match for the sparrows, but other swallows will come to their help and punish the thieves. In one case, when a thieving pair of sparrows had driven some swallows from their nest, they came back with some other swallows and tried to drive the sparrows away. When they could not do that they all went to work and tore the nest down and got rid of the sparrows that way, and then they helped build the nest up again. While in another case, a lot of swallows came with clay in their bills and actually built up a wall in the opening of the nest, so that the thieving sparrows were shut up

in prison, as it were, and could not get out but starved to death there.

But the crows help each other even more than this. Whenever a flock of them is busy getting food, one or two of the number will always be perched up on some high point and will always be keeping watch. And the moment the sentinel sees or hears anything that seems suspicious, he calls out to the others and they all fly away to a place of safety. Or if it is some great bird that is prowling around to try to catch their babies, they will all join together to drive her away, as you see them driving the owls away (173). And the rooks, who are the English cousins of our crows, will all join together to punish any pair that is caught stealing the sticks from another pair's nest to use in building their own. When a pair is found out doing this all the rest of the rooks cry out indignantly and go flying to the nest of the wicked pair and tear it all down and scatter the sticks in every direction. It is only the young pairs who try to steal from each other. The older ones have learned that they can live in flocks only by helping each other, and that the moment they begin to harm each other in any way they will scatter the flock and lose all the safety and pleasure that comes from living together. And they will lose all their education, too, for it is only by living together and helping each other that Mother Nature's children are educated. The swarms of bees and ants, the flocks and herds of birds and animals are the school to which living beings are sent to be educated. And so we find the ant and bee family the wisest of the insects, and the crow family the wisest of the birds, and the animals that go in flocks and herds the wisest and gentlest as well as the strongest of the animals.

*A brother is born for adversity.—Prov. 17, 17.*

United we stand; divided we fall:

It made and preserves us a nation.—*Morris.*

#### SUGGESTIONS TO TEACHERS.

*For Preparation:* A good statement in English of Social Life from the evolutionary point of view is to be found in Thomson's "Study of Animal Life." Darwin discusses the same subject in "The Descent of Man."

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth

you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. Give them no more of body than shows soul as Browning says of painting.

*Sources of the Illustrations:* The half-tone is by R. Hirth-du-Frenes. No. 169 is from Vasey's "Bulls, Bisons and Buffaloes," and was drawn by Catlin; No. 170 is from Wood's "Homes Without Hands;" No. 171 Delon's "Recits d' Hist. Nat.;" No. 172 is from Brehm's "Thierleben," and No. 173 from Michilet's "Nature."

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### VII.

#### HELPING EACH OTHER.

##### Part IV.—Men and Women.



#### HELPING TO SAVE EACH OTHER.

Mr. Henry, the man who painted this picture, calls it "Women and Children First." It is a shipwreck. That great vessel has been driven on the rocks by the wind and the waves. You can see the waves rising and breaking over the stern of the ship, so that the people who were sailing in the boat have had to run forward to the bow of the vessel where they are crowding against the rail. In a little while the mighty waves will break the vessel all to pieces, and keep the men and women and little children out to the water; and with such terrible waves rolling and breaking, I fear they would all be drowned. Certainly all the women and children could be. And they have no way of saving themselves, because all their small boats have been swept away by the waves.

But you see that large, strong boat in the center of the picture, that has come rowing out over the wild waters right up to the stranded vessel, to save the poor shipwrecked people. Those men in the boat have risked their lives to save the men and women and children who were in such terrible danger. Their large, strong boat was built

on purpose to save shipwrecked people. The men who row it live on the shore in a house called a Life Saving Station. We hire them to remain in the station night and day with their boat all ready to be used at a moment's warning. One of them is always looking out for ships that may need their help, and when it is stormy some of them walk up and down the shore for miles to see if there is any shipwreck. And the moment one of them sees a ship in danger, he tells the rest of them and they spring into their boat and row right out into the wildest waves to help save their fellow men. And you see in the picture that they have rowed up to the side of the vessel, and the people on the vessel are lowering the "women and children first" into the life-boat. They have let down one woman, who is sitting in the middle of the life-boat and stretching her arms up to the ship. For you see her little girl is being lowered next, held fast in the strong arms of the man who is slipping down the rope. And when the life-boat has all the women and children and as many men as it can carry the boatman will row to the shore and leave them there, and come back and save the rest of the men. But these brave boat-



men never could spend all their time helping to save others, unless we helped them in turn by giving them shelter and food and clothing for their wives and children. But our help does not pay them for their courage. Only our gratitude and

living together and helping each other was the beginning of our civilization. For civilization is really only the art of living together and helping each other. And the greater the number of people who can live together and the more they can help each other, the more civilized they are, and the more safe and happy they are.



175. EARLY MEN HELPING EACH OTHER AGAINST THE CAVE-BEAR

love and honor can do that. And I suppose they must love their fellow men a good deal, or they would not risk their lives to save them.

In the next picture (175) you see three or four men rushing out of a cave to save one of their number who has been attacked by the cave-bear. That terrible creature has struck his sharp claws into the man's shoulder and knocked him down upon the ground, and I fear he would soon have killed the poor fellow if the other men had not heard his cries and rushed up to save him. One of them has a heavy club and the other two have stone axes, and they will drive him away and save their friend. That was the way men used to save each other long ages ago, before they had steel axes or guns, or clothing, or houses to live in. They lived in caves, as you see in the picture, and wore the skins of wild animals. But they had already learned to help each other. They lived in little bands of a few men, women and children together, and the men had clubs and stone axes and knives to keep away the hungry animals and to kill some of them for food for themselves and the women and children. That

### HELPING EACH OTHER TO MOVE AND BUILD.

In the picture of the Fuegians you see a little band of savages, like those in the last picture of the cave-bear. And the Fuegians are helping each other, too. They live away down south in South America, where it is cold and snowy, as you see it in the picture. They do not have much but fish to eat. And when the fish fail them, or the water gets frozen over at one place, they move to another place and carry all their things with them, even their house and their boats. You see their smaller boat dragged through the snow, but I do not suppose you can see their larger boat and their house. Those sticks they have on their backs are the house and the larger boat. When they reach the water you can see at the right of the picture, they will set up a few of the long sticks and pile a little brush about and call it a house, though the snow will blow through it and cover them up when they are asleep. The other



176. FUEGIANS HELPING EACH OTHER TO MOVE.

long sticks they will tie together and make into a sort of boat to use in fishing. I do not suppose you would think much of their boats or their houses, and I dare say you think you would be

very wretched if you had to wade bare-foot through the deep snow and fish in the water in a

keep it from falling over, while a lot more men took hold of long ropes and pulled it along.



177. ASSYRIANS HELPING EACH OTHER TO MOVE.

ky canoe, and sleep in the snow. But they subtless feel that they are much better off than the savages who have no boats and no houses at all, and I am sure they are happier than some savages who help each other even less than the Egyptians do. The Fuegians are more civilized than such savages. And their canoe is the first step toward building a vessel. You have to learn their letters and words before you can learn to read, and so men had to learn how to help each other build a canoe before they could learn to help each other put the oak planks or steel plates together to make the huge vessel you see in this picture. And they had to learn how to help each other build a swarm of sticks before they could learn how to build the great steel buildings we have here in Chicago, seven or twenty stories high.

You see in the picture (177) how the Assyrians moved the great stone image that was to make one side of the door of one of their great palaces. The picture is not a very good one, because it was copied from carving on a stone tablet made about three thousand years ago, before they had learned how to make very good pictures. It shows how they helped each other to build their houses

those days. You see they put the great heavy stone on a sort of sled made of wood, and a lot of men on each side held it by ropes to

they never could have built any large houses if they had not helped each other.

### HELPING EACH OTHER TO GET FOOD.

In the picture of the women grinding flour (178) you can see how people begin to help each other get food. When the savage family wanted fish or meat the men would go fishing or hunting for the whole family, and when it was bread that was wanted the women would stay at home grinding up the wheat by rubbing it on a stone. Each of the women at the left side of the picture is stooping over a large, flat-topped stone. On



178. AFRICANS HELPING EACH OTHER TO PREPARE FOOD.

that stone the woman puts some grains of wheat and then takes the smaller stone and rubs the wheat till it is broken and crushed into white



flour, which runs down the sloping stone into the big bowl sitting under the edge of the stone. And when they get enough of the flour they make bread of it. In a large family somebody has to do the grinding all the time to keep bread enough on hand, and somebody must be fishing or hunting all the time to keep up the supply of flesh. If the men stopped doing their share of work the family would be likely to starve, and if the women stopped doing their share the same thing would happen.

As men have grown more civilized—more able and willing to help each other—they have gathered in larger bands, and some of the families have done all the fishing while others have raised cattle instead of hunting, so that we could have meat; and still others have made the rivers grind the wheat by means of water-wheels, so that we could have flour, and yet others have planted the wheat so that we might have plenty of grain. So the farmers help us by giving us the wheat, the millers by giving us the flour, the ranch-men and butchers by giving us the meat, the fisherman by giving us the fish, the weaver by giving us the cloth, the miners by giving us the iron and steel and coal. And of course we have to help all these people in turn, or they and their families would starve. What does your father and your mother do for all these people to pay them for what they do for us?

In the picture of the Japanese mother buying some candy for her baby (179) you see that the mother not only does not have to make the candy, but she does not have to go to the store to buy it. The man brings it right to the door. And if you look closely you will notice that she is handing a piece of paper to the man. I suppose she is giving him some money to pay him for the candy, and he seems quite willing to give his candy for the money, because he knows he can use it to buy bread and clothing for his wife and children. Where do you suppose she got the money? Of course you will say that her husband gave it to her, as all Japanese husbands do. But where did he get it? He helped somebody else by doing

something for them and they paid him by giving him the money. So that the use of money itself is really a means which we have discovered of helping each other more easily than we could



179. JAPANESE HELPING EACH OTHER TO GET FOOD.

without it. It is only civilized people,—people who help each other,—who have money, and every single piece of money means just so much help that the owner of the money has done for some one in earning the money. And the man that has done the most for others ought to have the most money, or at least the most health and happiness, and the man who has done the least ought to have the least money. We must help each other then if we want to be rich and healthy and happy. For you remember that the most successful flowers were those who helped each other, and the most successful insects and animals were those who helped each other the most. And the most successful men and women and the most successful nations will be those that help each other most.

*Thou shalt love thy neighbor as thyself.*

—Lev. 19, 18.

*Bear ye one another's burdens.*—Gal. 6, 2.

All are needed by each one;  
Nothing is good or fair alone.

He serveth the servant,  
The brave he loves again.—Emerson.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is by T. M. Henry. No. 175 is from Figuier's "Primitive

Man;" No. 175 from Wood's "Nat. Hist. of Man;" No. 177 from Layard's "Discoveries in Nineveh and Babylon;" Nos. 178 and 179 are from Hellwald's "Naturgeschichte der Menschen."

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### VIII.

#### LAYING UP FOOD.

##### Part I.—Men and Birds.

O, the long and dreary Winter !  
O, the cold and cruel Winter !  
Ever thicker, thicker, thicker  
Froze the ice on lake and river,  
Ever deeper, deeper, deeper  
Fell the snow o'er all the landscape,  
Fell the covering snow and drifted  
Through the forest, round the village.

Hardly from his buried wigwam  
Could the hunter force a passage ;  
With his mittens and his snowshoes  
Vainly walked he through the forest,  
Sought for bird or beast and found none,  
Saw no track of deer or rabbit :  
In the ghastly, gleaming forest  
Fell, and could not rise for weakness,  
Perished there from cold and hunger.

O, the famine and the fever !  
All the earth was sick and famished ;  
And the lovely Minnehaha  
Lay down on her bed in silence,  
Lay there trembling, freezing, burning.

Forth into the empty forest  
Rushed the maddened Hiawatha ;  
Into the vast and vacant forest  
On his snowshoes strode he forward.

" Gitchie Manito, the mighty ! "  
Cried he, with his face uplifted,  
In that bitter hour of anguish,  
" Give your children food, O Father !  
Give us food, or we must perish !  
Give me food for Minnehaha !  
For my dying Minnehaha ! "

—Long fellow, *Hiawatha*.



#### HOW MEN LAY UP FOOD.

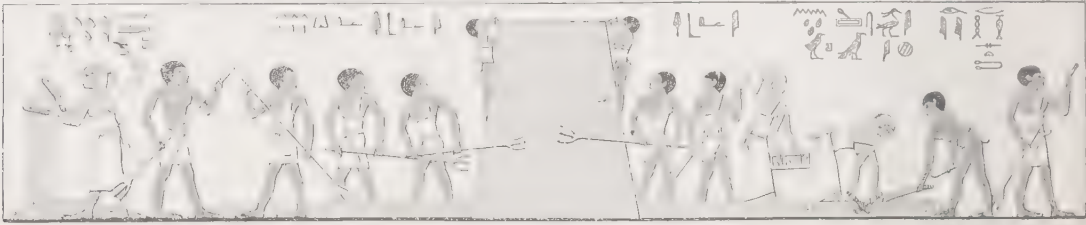
"The Forester's Daughter" is the name of this picture. The young lady's father is the "Forester"—the man who takes care of the lands of a German nobleman—and so she lives in the country, where she can have birds for her pets. And when the ground is all covered with snow, so that the birds could not find anything to eat, she gives them food. She has her apron full of something that they like very much, so that they fly right up to her and even alight on her shoulder to get it. What do you suppose it

is, and where did she get it? Perhaps it is corn, or wheat, or some other grain, and I imagine that her father has a lot of it stored up in his barn or his granary. He knew that when winter came and covered the ground with snow, he and his family would want the grain for food. So he planted the grain in the spring, and when it was ripe he harvested it and stored it up in a building he had made for it. And wherever men are civilized they lay up food in summer for the winter time, so that they may not starve, as the poor Indians did in *Hiawatha*. Here in Chicago



we have a lot of "grain elevators," as they are called, which have been built to hold the millions of bushels of grain that the farmers raise on

But before men had learned to make bricks, even, they used to store up food. To keep it safe they used to cut down tree-trunks with



181. ANCIENT EGYPTIANS LAYING UP WHEAT IN A BRICK GRANARY.

their farms. This grain is loaded on the cars and drawn to the elevator, and then carried up by machinery from the car to the top of the building, more than a hundred feet from the ground, and from there it is poured into the great bins or rooms of the elevator, till we want it to eat, when it is drawn out of the bottom of the bins and sent to the mills to be ground into flour.

But men did not learn to make such great storehouses as these elevators, all at once. They made smaller buildings first. In the picture of the Egyptians storing grain (181) you can see the granaries that they had in Egypt thousands of years ago. The picture is not a very good one, because it was drawn by the Egyptians themselves, who could draw no better than children, but it is meant to show how they stored up their wheat. They used to spread the stalks with the heads of grain upon the ground and drive the cattle over them to tread the grain out of the husks; and then they would toss it in the air, to let the wind blow away the straw and chaff, as you see one of them doing on the left. They did not have any threshing-machines as we do now and so they had to do it that way. When it was clean enough, they put it into that box-like thing in the middle of the picture, which is really a round brick building, with a hole in the top to put the grain in, and another hole at the bottom to take it out, very much like one of our elevators, only a great deal smaller. The Egyptians used to have a lot of these round brick granaries built together, and fill them at harvest time and then draw out the grain, little by little, as they needed it to eat.

their stone axes and drive them into the bottom of shallow lakes and build rough houses on the top of these piles, out of the reach of the waves and of animals and men on the shore. You see one of these pile-houses in the picture (182) of the South American Indians. That is the way they lived in Venezuela a few years ago, and that is the way they lived in Switzerland a great many centuries ago, long before history began; only they did not have any white cloth to wear, in those early times. We can still find their piles in the bottom of the Swiss lakes, and among the piles we can rake up the stone knives and stone hatchets that they used then. And in some places we can find a bushel or two of grain, some nuts, and some apples cut up and dried. These things are burnt by fire, showing that the



182. AN INDIAN HOUSE IN VENEZUELA.

pile houses of these early men caught fire and burnt down and the food they had gathered for the winter fell through the burnt floor into the lake, where it has lain for thousands of years.

And in some of the caves where men lived even before they learned how to build pile-dwellings, we find little heaps of grain and dried fruit, tucked away in some nook to use in the winter and then forgotten and left untouched all these ages. So you see how men learned to lay up food, first a few handfuls of dried berries in a cave, then a few bushels of grain and nuts in a pile-house, and then a few hundred bushels of wheat in the brick granaries of Egypt, till now we have millions of bushels stored up in our elevators here in Chicago alone. No one need starve to death now, as so many Indians did when America was discovered, or as the people in France and England used to do every few years during the Middle Ages. If anyone lacks food anywhere, as the people of Ireland did a few years ago, we draw out the grain from our granaries and load it on a ship and send it to them. By learning to lay up food we can help each other better than ever before.

#### HOW BIRDS LAY UP FOOD.

The birds have learned to fly so well that they do not often need to lay up food. When winter comes, with its snow and ice, they fly away to the south, where they find plenty of food.

"Far over purple seas  
They wait, in sunny ease,  
The balmy southern breeze

To bring them to their northern homes once more."

But even the birds sometimes store up food for the future. I remember how puzzled I was



183. THE WOODPECKER STORING ACORNS IN THE BARK OF A TREE.

once by finding an acorn sticking in a little hole made in the bark of an oak tree-trunk, up in Michigan, something as you see it in the picture (183) of the California woodpecker, only the

tree-trunk was straight up and down. The hole exactly fitted the acorn, yet it had not been made by a knife or an auger. It looked as if



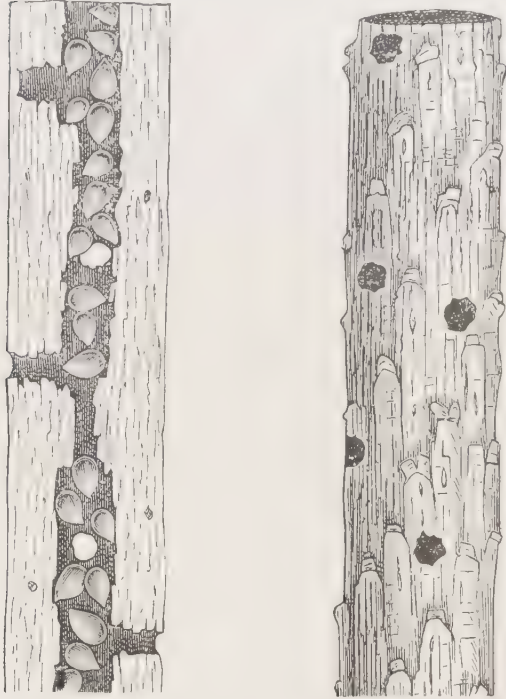
184. THE WOODPECKERS' NEST.

it had been made by a woodpecker. But if it had, I could not understand how the acorn could have been pushed tightly into the hole, so that only the cup end stuck out. But I have learned since that the hole had been made by a woodpecker, and that he had brought the acorn and hammered it in, that he might get it for food whenever he needed it. Our red-headed woodpeckers do not do it very often, but the California woodpecker stores up ever so many acorns this way, just filling the bark of oak and pine trees with nuts in the fall. And sometimes they try to store them up in the boards of houses. A man in California let the birds use the end of his house for this purpose, and they sometimes made the holes in the boards so deep that, when they tried to eat the nuts, they lost one now and then by its dropping through into the house. But on the ground outside he found only the empty shells they had thrown away after eating the meat.

I suppose the woodpeckers store up food more than other birds because they have such a sharp, strong bill to cut into the wood with. You see in the picture (184) of their nest how well they dig right into the middle of the tree and make a large cavity for their eggs. One of them is going into the nest and the other is just beginning to make a nest. You might



think they would dig out such a place as this for the nuts, but the mice and squirrels could get at them if they did. So they stick them into the bark one by one; or else they find a



185. THE WOODPECKERS' STOREHOUSE.

hollow, reed-like plant, so hard that mice and squirrels cannot nibble it, and put them in there

till they want them. In the picture of the woodpeckers' storehouse (185) you see the hollow stalk that these birds use in Mexico. On the right hand it is shown with the holes the birds make to put the acorns in, while on the left it is cut open so you can see the acorns in it. In the autumn, when the acorns are ripe, the birds find these plants and drill holes in them and bring acorns and drop them into the holes till the plant is full, as you see it on the left. Then, as winter comes and there is no other food, the birds come and thrust their sharp bills into the hole at the bottom and draw the nuts out one by one, sticking each one in a hole in the bark of a tree to eat it. A Swiss student saw some of these birds getting and eating the acorns this way in the spring at a place where they must have brought the nuts thirty miles, because the nearest oak trees were as far away as that.

So you see the birds have found out how to make elevators for nuts and to bring the acorns from their farms miles away and store them up till they need them, just as men do. And I suppose the same Wisdom that taught us, taught them also.

*Is not the life more than meat?—Matt. 6, 25.*

Sow love, and taste its fruitage pure;  
Sow peace, and reap its harvest bright;  
Sow sunbeams on the rock and moor,  
And find a harvest-home of light.—Bonar.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is by H. Werner. No. 181 is from Meyer's "Geschichte des alten Egyptens;" No. 182, from Brown's "Races of Mankind;" No. 184, from Wood's "Homes Without Hands;" No. 183, from the Encyclopedia Britannica; and No. 185 from Houssay's "Industries of Animals."

*For Preparation:* Houssay's "Industries of Animals" has the best brief treatment of the subject, in the chapter on "Provisions and Domestic Animals." "The Natural History of the North American Birds," by Baird, Brewer and Ridgway has a good account of the woodpeckers, though Brehm's "Thierleben" is the fullest and best.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read.

In teaching these lessons thus to the children they will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth

can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

### MOTHER NATURE'S CHILDREN.

- I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.
- II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Fish; 8. Plants.
- III. *Setting the Table.* 9. Birds; 10. Monkeys to Spiders; 11. Insects; 12. Plants.
- IV. *Clothing the Family.* 13. Birds; 14. Animals; 15. Mollusks; 16. Plants.
- V. *Learning to Walk.* 17. In Water. 18. On Land. 19. On Four Feet. 20. On Two Feet.
- VI. *Learning to Fly.* 21. Seeds; 22. Insects; 23. Fish to Lemurs; 24. Birds and Bats.
- VII. *Helping each other.* 25. Men; 26. Beavers; 27. Termites; 28. Flowers.
- VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.
- IX. *Borrowing and Lending.* 33. Men from Animals and Plants; 34. Animals and Insects from Plants; 35. Plants from Earth; 36. Earth from Sun.
- X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### VIII.

#### LAYING UP FOOD.

##### Part II.—Rodents.

Then the little Hiawatha  
Learned of every bird its language,  
Learned their names and all their secrets,  
How they built their nests in summer,  
Where they hid themselves in winter.  
Of all beasts he learned the language,  
Learned their names and all their secrets,  
How the beavers built their lodges,  
Where the squirrels hid their acorns,  
How the reindeer ran so swiftly,  
Why the rabbit was so timid;  
Talked with them when'er he met them,  
Called them "Hiawatha's Brothers."

Then Iagoo, the great boaster,  
Made a bow for Hiawatha;  
From a branch of ash he made it,  
From an oak-bough made the arrows.  
Forth into the forest straightway  
All alone walked Hiawatha  
Proudly, with his bow and arrows;  
And the birds sang round him, o'er him,  
"Do not shoot us, Hiawatha!"  
Up the oak-tree, close beside him,  
Sprang the squirrel, Adjidaumo,  
In and out among the branches,  
Coughed and chattered from the oak-tree,  
Laughed, and said between his laughing,  
"Do not shoot me, Hiawatha!"

*Longfellow, Hiawatha.*

#### How the Nibblers Lay Up Food.

Sir Edwin Landseer, who painted the first picture that we had, is the one who painted this picture also. He calls it "A Piper and a Pair of Nut-Crackers." The "piper" is that little bird singing so gaily, and I suppose the "nut-crackers" must be those two pretty squirrels sitting up in the hollow of the tree and eating nuts so busily. But they are not exactly "nut-crackers," because they do not crack their nuts. They use their sharp teeth to nibble the shell away till it falls off and leaves the nut in their tiny hands, and they then eat the nut by nibbling it a little at a time. They like to make their



home in the hollow trees and eat their food there, as you see them doing in the picture. You can see some nuts scattered about them in the hollow tree. They have brought those nuts into their home to eat when they want them. They do not like to go out to get food when it is cold or rainy. If you happened to be in a forest just before a rain-storm you would see the squirrels all hurrying about and gathering food as fast as they could, and carrying it to their nests in the trees; but as soon as the rain began every squirrel would disappear. Then if you could look softly into their



nests you would see them packed cosily away, sometimes three or four in a nest, and with plenty to eat till the storm was over. And you would find that all the openings in their nests



187. NEST AND STOREROOMS OF THE CHIPMUNKS.

were carefully closed by leaves or twigs to keep out the wind and rain.

But when the long, cold winter comes they have to lay up a great deal more food than they do against a rainy day. So in the fall you will see them very busy gathering the nuts from the trees as fast as they get ripe, and storing them away in various places. The red squirrels are the ones we see oftenest in this country, and they generally lay up their food in the hollow trees where they live during the winter, and sometimes a single pair will store up between one and two bushels of nuts. But in Maine, where I used to live when I was a boy, the red squirrels used to hide the nuts they gathered in little piles under the leaves near the tree they grew on. There was one oak tree that had better acorns than any other tree, and the squirrels used to come out of the forest to that tree and gather the acorns and put them in little holes in the ground and cover them over with leaves. I suppose they thought that they would not have time to carry them so far while they were gathering them. And I have learned since that they come to get them later, when they have eaten up the food they have in their nest. They remember the exact spot where they hid them, so that they can dig with their

little feet down through the snow and get them. But I am afraid that some of the squirrels that hid the acorns near that tree were disappointed when they came to get them in the winter, for we boys used to look under the leaves and sometimes discover the little treasures. We thought it was great fun to have the squirrels gather our nuts for us, but I don't believe it was great fun for the poor little fellows when they came in the cold and snow to get their store of food and had to go back without it.

But the squirrels sleep a great deal during the winter, especially in our northern states, and so they do not need very much food. In the far north they make their winter homes under ground, because they find it too cold in the trees. The little striped squirrel, or "chipmunk," as we used to call him, lives under the ground summer and winter both. In the picture (187) of the storehouse of the chipmunk you can see how he makes his house. Two or three feet below the ground he has a large room carpeted with soft dry leaves, and in this room Mrs. Chipmunk tends her little ones till they get large enough to take care of themselves. But besides this nur-



188. NEST AND STOREHOUSE OF THE DORMOUSE.

sury and living room there are several other rooms leading off in different directions. You see one of them in the picture leading up towards

the right hand side of the picture. These side rooms are the cellars or store-rooms of the Chipmunk family, and the members of the family are very busy in the autumn gathering their little harvest and packing it away in the different rooms of their underground house. In a single one of these houses a naturalist found one quart of hazel nuts, eight quarts of acorns, two quarts of buckwheat, and four quarts of wheat, besides some grass-seed, making fifteen quarts these little creatures had gathered and stored away; and they had to bring much of the food a long distance. And how do you suppose they can carry such things as wheat? Each one of them has a bag in his cheeks on each side of his mouth, and he can pack away in these bags three or four hazel nuts at once and a table-spoonful or two of wheat. If you could look closely at one of them as he was going home with his load of food, you would think he had the mumps, because his cheeks stick out so.

Another little nibbler that lays up food is the dormouse. You see how small a creature it is in the picture of the dormouse's storehouse (188), for it is only a little longer than the stag-beetle, and the younger dormouse, at the right of the picture, seems afraid of the beetle and thinks of climbing into its little home out of danger,—for that little bunch of twisted leaves and grass is the summer-house of the dormouse, built up in the crotch of a bush. But the dormouse does not lay up its winter food in the summer-house. It finds some secret nook, like the underside of a stick that is lying on the ground, and stores its nuts and grain up there. You see the larger dormouse in the picture bringing a hazel nut down from the tree to hide it with the little pile heaped up at the lower corner of the engraving. When winter comes it will make a nest for itself in some snug sheltered place and go to sleep and stay asleep most of the time till the warmer weather comes. Then it will wake up hungry and will find its little store of nuts and eat them. How do you suppose it knows that it is going to need the food when it wakes? Who tells it to lay up the store?

You will find another wise little nibbler in the picture of the crying hares harvesting hay (189). These creatures live in the mountains of Asia, but they have an American cousin living in the Rocky mountains, and the cousin is called a cony by the people who live there. You see that one of them has his mouth full of grass. He has been cutting the grass with his sharp little teeth and now he is carrying it to some little nook in the rocks where he will dry it and pack it away for use in the winter when the ground is covered deep with snow. These hares, or conies, live in holes in the ground and they make little paths running from one hole to the other. In summer, when the grass has grown large and high, they cut it down each side of those paths and dry it and store it away. Then when winter comes they make paths under the snow from their under-



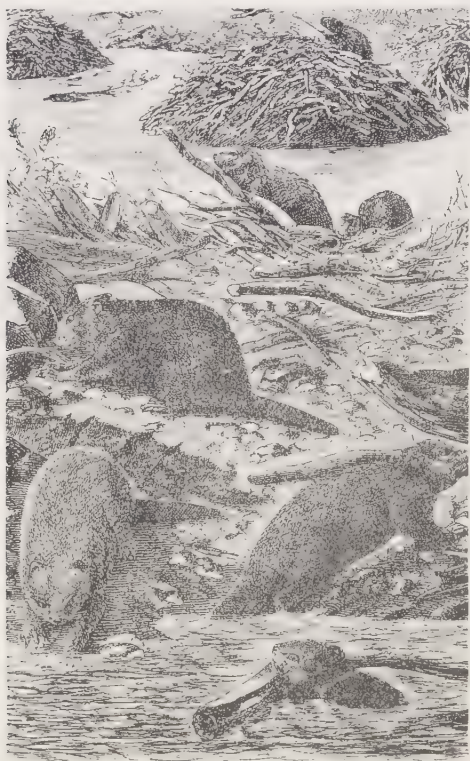
189. THE CRYING HARES HARVESTING HAY.

ground homes to the little rocky nooks or barns where they have stored their hay, so that whenever they are hungry they can run to their store and get some food. So you see that they too have learned somehow to know that they will need food for the winter and to be wise enough to lay it up beforehand.

But the wisest of all these wise nibblers is the beaver, who lays up his food in the water. And that he may have water to lay it up in he makes a pond for himself by building a dam in a stream. He and his wife, with two or three other beaver families, unite to build the dam. They must have logs to build it with, and as they do not have any axe to cut with they fell the trees by gnawing around them with their sharp teeth.



When a tree has fallen they cut it up into pieces short enough to be rolled into the stream. Then they push the pieces out into the place where they want their dam and pile them up there, with



190. THE BEAVERS LAYING UP FOOD.

stones and mud on them to keep them in place. When the dam is high enough, so that they have a pond, they build houses like those you see in the picture (190) of the beaver laying up food. Each pair of beavers has their own house, built by piling logs together and plastering the logs over with mud. The houses are just about big enough for play-houses for babies, but I am afraid our babies could not use them very well, because the doors are under the water, and they have no windows at all. But the beavers do not mind that, because they like to swim and dive in the water, and Mrs. Beaver has a soft dry bed in her house for the beaver babies. Mr. and Mrs.

Beaver and the babies live in their house in the winter when the pond is all frozen over, and as their food is the tender bark of the young shoots of trees they must store them up in the water before it is frozen over. So you will see them "working like beavers" all through the fall gnawing down trees and nibbling off the young shoots and smaller branches to lay up for food. As soon as a small branch is cut up the right length the beaver rolls it into the pond and swims with it to a place near his house, and then he dives to the bottom and fastens the branch there. After that he goes back to get another branch and brings it and fastens it beside the first, and so on till he has a great pile of tender branches lying in the water close to the door of his house. Then when winter comes and the water is covered with ice, he dives down through the doorway,—for that is under water, too, you remember,—and pulls a branch out of the mud and takes it into his house through that doorway; and then he and Mrs. Beaver and all the young Beavers have a nice juicy meal, for the water keeps the bark on the branches from drying up.

And after all the trees near the pond have been cut down the wise little creatures will dig canals from the pond to the trees that are farther off, so that the water can float the heavy branches and logs down to his home, just as men dig canals to float the grain to the cities that need it. And when the ground rises they will even make locks,—make stairs, as it were, in the canal, to float the logs down the hill. I shall not try to explain how such locks are made, because you are none of you old enough to understand it. Nor were the Indians educated enough to understand it, so as to make such locks for themselves. They always carried their canoes around such falls. So you see that somebody had taught these creatures so well that they were wiser in some things than the men who lived about them.

*O Lord, how manifold are all thy works! in wisdom hath thou made them all.—Ps. 104, 24.*

Who taught the nations of the field and wood  
To shun their poison and to choose their food?

—Pope.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is by Sir Edwin Landseer. Nos. 187 and 188 are from Wood's "Homes Without Hands;" No. 189 from Brehm's "Tierleben," No. 190 from "Wohnungen, Leben und Eigenthümlichkeiten in der Hoheren Thierwelt," by A. and K. Müller.

*For Preparation:* Houssay's "Industries of Animals" has the best brief treatment of the subject, in the chapter on "Provisions and Domestic Animals." Romane's "Animal Intelligence" has a full and good discussion of the wonderful instincts of beavers.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### VIII.

#### LAYING UP FOOD.

##### Part III.—Insects.

##### THE CUNNING BEE.

Said a little wandering maiden  
To a bee with honey laden,  
"Bee, at all the flowers you work,  
Yet in some does poison lurk."

"That I know, my little maiden,"  
Said the bee with honey laden;  
"But the poison I forsake,  
And the honey only take."

"Cunning bee, with honey laden,  
That is right," replied the maiden;  
"So will I, from all I meet,  
Only draw the good and sweet."

##### HOW BEES AND ANTS LAY UP FOOD.

"Business is Dead" is the name the French artist gives to this picture. You can see what the little fellow's business was,—a business that I imagine most of you would like very much. He was selling candy; just now no one seems to be buying of him, and so he helps himself to one of the sticks. If you had a lot of candy I think you would find it hard not to touch it. How would you like to belong to a family where they laid up candy for food, where they had all of their pantries filled with candy instead of bread and meat? I know of a family that does this, though I am afraid you cannot belong to it because it is the Bee family.

All summer long the bees who live in our hives are busy laying up candy in the form of honey, and their pantries are full of little honey-jars like those you see in the picture of the bee's pantry (92). The jars are made of a wax, which is called beeswax because it is produced by the bees. When they want the wax, a lot of the bees hang themselves up in a sort of curtain in the hive, and after they have been hanging quietly for a while, the plates of the wax begin to form on the under side of their bodies. Each one pulls out her plates one after the other and chews it in her



mouth to make it soft, and then uses it to build the little honey-jars that you see in the picture. As fast as they finish the jars they fill them with honey, which they get from the flowers. Each of the little hive bees has, inside of her body, a tiny honey-sack, that will hold about one-third of a drop, and she fills this honey-sack by sucking up through her tube-like tongue the sweet juices of the flowers. Sometimes she has to visit very many flowers before she can get enough to fill the sack; but when she has filled it, she goes flying



straight back to the hive and hurries in through the doorway and climbs up on the pantry of honey-jars,—or honey-comb, as it is called,—and puts her head inside one of the jars and empties the honey out of her sack into the jar. Then she goes out of the hive to fill the sack again and to bring another third of a drop to put in the jar.

So she and her thousand of sisters work all day long and all summer long, and when the cold winter comes they have a good many pounds of honey laid up to feed on during the time that there are no flowers. And besides the honey, they gather the pollen on the flowers and store it up to use for bread to eat with the honey. If you watch

inside of their bodies. By using the sack for this purpose it has stretched so that it is as large as a pea and will hold quite a lot of honey. But it

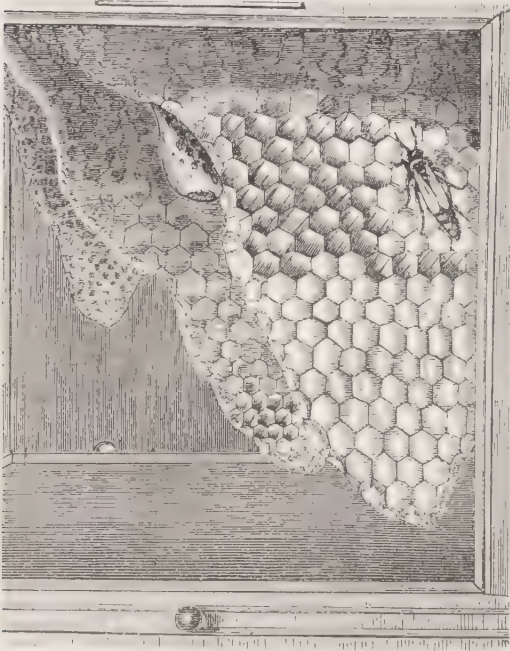


193. HONEY ANTS HELPING A LIVE HONEY BAG.

makes the ant look very odd, as you see from the pictures of the honey ants; and their honey-bag is so heavy that the ant who has it cannot walk about. She becomes a sort of living honey-bag. In the picture (193) of the honey ants pulling a honey-carrier into the house, you can see how helpless the ant is. The man who drew the picture had cut into one of their nests to see how they lived, and in doing so he left one of these honey-carriers out of the nest. She could not help herself back into the nest, but two of her sisters came up and one of them pulled at her big bag and the other pushed to get her into a safe place. In the other picture (194), one of the honey-carriers has fallen from her hold on the wall, in the upper part of the picture, and one of her sisters has come to help her up to her place again. She takes her sister by the teeth,—or mandibles, as they call the ant's pincer-shaped mouth,—and pulls, and in the lower part of the picture you can see that she has succeeded in dragging her up to her place. There are several hundreds of these honey-carriers in each nest, and when they are all filled full, there would be quite a lot of honey stored up for winter. Of course their sisters who have the small bags must bring the honey to them and feed them with it. Then when there is no honey to be had out of doors they can pay their sisters by feeding them in turn.



194. A HONEY ANT HELPING A LIVE HONEY BAG TO ITS PLACE IN THE PANTRY.



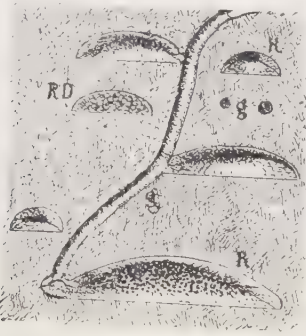
192. THE BEES' PANTRY OF WAX HONEY-JARS.

the bees closely in the summer as they go into the hive you will see little yellow bunches on their hind legs. Those bunches are made of the pollen which they stick to their legs as they gather it from the flowers, something as you would put acorns in your pockets as you gather them under the trees. When they get into the hive they scrape the pollen off and put it into one of the empty honey-jars, pushing it down with their head. So that they have both bread and honey to feed upon in winter.

But the bees are not the only insects that lay up honey. Some of the ants, who are the cousins of the bees, have learned to do the same thing. But instead of making cells of wax, the ants have stored their honey up in the honey-sacks

Another way that ants have of getting food for winter is by laying up the seeds and plants, just as men lay up wheat. In the picture of an ants' storehouse (195), you see the tiny underground

rooms leading off from the passage-way on both sides. The ants dig the round passage-ways,—or



195. THE ANTS' STOREHOUSE.

ant-holes,—down a few inches and then make a level, circular room, something like a small saucer bottom-side up, and then they dig down a few inches farther and make another, and so on till they go down six or eight feet into the ground. Some of these rooms they use for nurseries, but others for storing up seeds. The lowest room in the picture has seed in it, while the middle room is empty. In the next picture (196), you can see how she uses her jaws,—or mandibles,—in biting and tearing the seed loose. When she has broken the seed from the stock she will carry it to the nest and store it in one of the rooms.

Then she will come back and get another seed, and so on, till all the seeds of the sunflower are gathered. And while she is doing this her sisters are hunting through the grass in all



196. AN ANT HARVESTING SUNFLOWER SEEDS.

directions for other seeds and bringing them in as fast as they find them. So that when winter comes and there are no more seeds to be found out of doors they will have plenty of food in their store-rooms. And if the rain gets into their storehouse and wets their grain they will bring the seeds up out of the store-rooms and spread them in the sunshine to dry them on the first clear day, just as men would do with their grain, and then pick them up and carry them back again as soon as they are dried. For these wise little creatures have learned that if a seed gets wet it will sprout and grow and so be spoilt for food, but if it is kept dry it will not grow.

Of course it is hard for the ants to carry these seeds so far, for many of the grains are as large

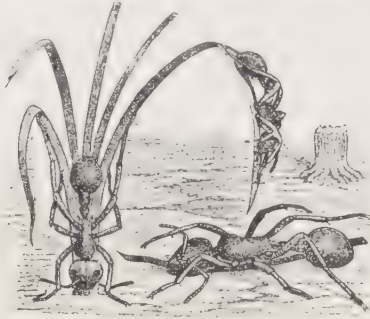


197. THE ANTS' CLEARING AND FARM.

as the ants themselves, so the ingenious little things make roads leading in all directions from their nest and clear a space right around the nest, as you can see in the picture of an ant-clearing (197). The roads are two or three inches wide at the end nearest the nest, and grow narrower and sometimes divide as they get farther away. And some of the ants even raise a crop of seed right on their clearing itself. Each spring a lot of ant-rice, as it is called, grows up in a ring around the opening of their nest, just far enough away from the nest to leave them room to move about. As soon as the rice is ripe the ants gather the seeds and store them under-ground. Then they go right to work cutting down the stalks of the ant-rice as you see them doing in the picture (198), one of them biting at the end close to the ground and the other bending the stalk by getting at the top end of it. In a short time their clearing is



entirely free from the ant-ridge, with only a stump of grass left here and there like the one you see at the corner of the picture, looking exactly like the stumps the human farmers leave on their fields. And the ant-field stays cleared till the



198. TWO ANTS CUTTING DOWN A GRASS STALK.

new crop comes up next year, when they harvest it and clear it away once more. And so they do year after year, as regularly as the farmer gathers his corn and clears his ground for a new crop. And so men have thought that they planted

the rice and have called them the agricultural, or farmer ants. They live in America in the southwestern part of our own country, and perhaps some of you can watch them and find out whether they really plant the rice or not. They are so wonderfully wise in other things that I should not be at all surprised to learn that they were really tiny farmers. But whether they are farmers or not, you see that they have been taught to provide for the future by storing up food, just as the animals and men do, and that the same Wisdom that tells us to provide for the future also tells them and teaches them the way.

*Go to the ant, thou sluggard; consider her ways and be wise: which having no guide, overseer, or ruler, provideth her wheat in the summer, and gathereth her food in the harvest.—Prov. 6, 6-8.*

Seeing only what is fair,

Sipping only what is sweet,

Thou dost mock at fate and care,

Leave the chaff and take the wheat.

—Emerson, *The Humble Bee*.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is by C. Achille-Fould. No. 192 is from Wood's "Homes Without Hands." The remaining cuts are from Dr. McCook's valuable works; Nos. 193 and 194 are from his "Honey Ants," and the remaining cuts from his "Tenants of an Old Farm." He is interested in our attempt to teach religion through nature and has kindly allowed us to reproduce his cuts.

*For Preparation:* Houssay's "Industries of Animals" has the best brief treatment of the subject, in the chapter on "Provisions and Domestic Animals." Romane's "Animal Intelligence" has a full and good discussion of the wonderful instincts of bees and ants.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read. It might be well to bring in a bit of honey-comb to make it more concrete.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. Give them no more of body than shows soul, as Browning says of painting.

In teaching these lessons thus to the children they will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*Outline of the Course for the year:* It will be seen by the outline given before that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, "Setting the Table" through the third, "Clothing the Family" through the fourth, "Learning to Walk" through the fifth, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

### MOTHER NATURE'S CHILDREN.

I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.

II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Fish; 8. Plants.

III. *Setting the Table.* 9. Birds; 10. Monkeys to Spiders; 11. Insects; 12. Plants.

IV. *Clothing the Family.* 13. Birds; 14. Animals; 15. Mollusks; 16. Plants.

V. *Learning to Walk.* 17. In Water. 18. On Land. 19. On Four Feet. 20. On Two Feet.

VI. *Learning to Fly.* 21. Seeds; 22. Insects; 23. Fish to Lemurs; 24. Birds and Bats.

VII. *Helping each other.* 25. Men; 26. Beavers; 27. Termites; 28. Flowers.

VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.

IX. *Borrowing and Lending.* 33. Men from Animals and Plants; 34. Animals and Insects from Plants; 35. Plants from Earth; 36. Earth from Sun.

X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### VIII.

#### LAYING UP FOOD.

##### Part IV.—Plants.



#### WHY PLANTS LAY UP FOOD.

How frightened those poor little children are! They must wish their father and mother were here now, with all of those deer gathered about them. They have got close to a big tree for safety, and you can see how the older sister has one hand on the tree and the other around her younger sister's neck. The brave little girl is bound to protect her sister, even if she is afraid. But she need not be afraid of those gentle creatures. They would be afraid of her and would all run away if she should start toward them. They have only gathered to see what these two little girls in the forest are like, for deer are very inquisitive creatures and hunters often catch them by setting up some strange object in the woods; and they will quickly gather about it to see what it is, as they have gathered about these two little girls.

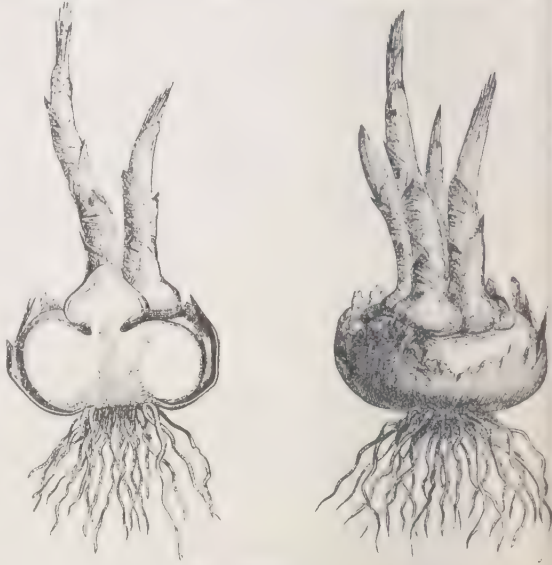
But how did these girls happen to get out to the forest among the deer? If you will

look on the ground near their feet you will see a little basket with some flowers in it, and I suppose from that basket that they were out in the woods gathering flowers. Their mother dressed them warmly because it was still cold weather, and let them take the basket and go into the woods for the earliest flowers, like the hepatica and anemone and the trailing arbutus, which we used to call the mayflower in New England, though we found it in April. But these little children are English girls and so I suppose they do not find exactly our mayflowers in their English forest. Yet they have found some very much like them, as you see from the picture; and they find the flowers early in the spring, because the flowers in the forest have to bloom early in the year or not at all. For when the trees have put forth their leaves, the forest will be so shaded and dark that the plants could not get the sunshine they need for their flowers. But you remember that the flower is only the cradle in which



the mother plant tends and feeds her baby seeds, and she cannot feed the babies without getting food somewhere. If she waited to get it from the earth and the air through the leaves and roots, she could not cradle her baby seeds until the roots and leaves had been getting food and storing it up for weeks and months. But by that time in the forest it would be too late for her babies to get the sunshine they need.

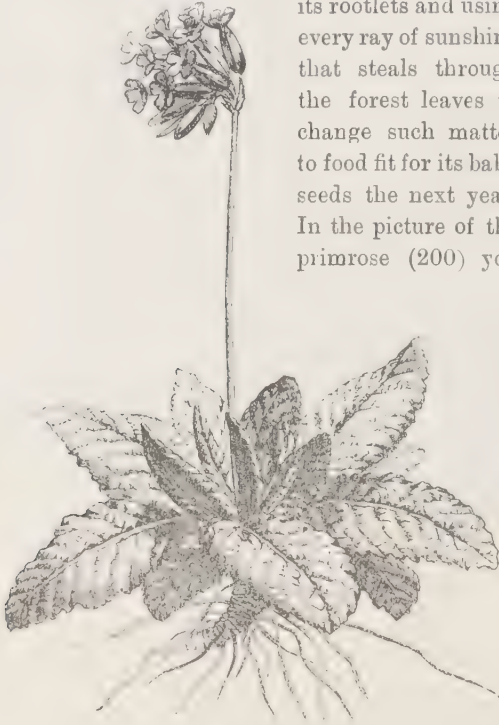
So what do you suppose these thoughtful little mother plants who live in the shady forest do? They lay up the food for their flowers and their baby seeds the year before. All summer long the plant is sucking up fluid matter through its rootlets and using every ray of sunshine that steals through the forest leaves to change such matter to food fit for its baby seeds the next year. In the picture of the primrose (200) you



201. THE STOREHOUSE OF THE CROCUS.

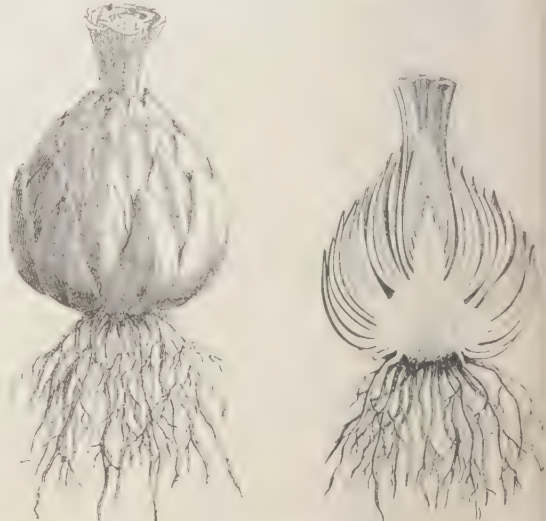
In the picture of the crocus storehouse (201), you can see still better how Mrs. Crocus lays up the food for her family. That round ball is only a short, fat stem packed full of food, as you can see on the left side of the picture, which shows the stem cut into two pieces. The reason the crocus can send up its blossom so early is because Mrs. Crocus stored up the food last year. I suppose she must have lived in the forest originally or in some place where her baby seeds would not have a chance in life unless she started them very early in the spring. So she laid up the food for them the year before; and she still keeps up the habit, though she no longer lives in the forest, but has been transplanted to our open lawns.

The lily is another plant that stores up food



200. THE STOREHOUSE OF THE PRIMROSE.

can see, down under the leaves, the thick stalk with the little roots starting out from it; that thick stalk is where Mrs. Primrose laid up the food for her babies last summer. She packed the stalk full of nice food, and when the cold winter came she went fast to sleep. But as soon as spring came, she built up that long stem with the cluster of flowers on the top of it, filled with baby seeds, and each seed with its own store of food. Mrs. Primrose could not have done that, if she had not had that store of last year's food to use; and as soon as she gets the family of baby seeds well started in the world, she will begin to gather more food through her roots and leaves and lay it up for her children next year.



202. THE STOREHOUSE OF THE LILY.

for the next year, but instead of packing it all in the stem, she puts most of it in the leaves. You remember the picture we had of the baby lily in winter flannels (202), and if you could look closely at the leaves that are packed about the baby plant, you would find that they were thick and filled with food. If you cut open an onion you can see the thickened leaves, for the onion belongs to the same family that the lily does, and lays up food one year for its babies the next year. And the onion does even more than the lily does to protect the baby plants inside the thick wrappers. When you cut up the onion the smell will be so strong that it will make your tears come, and you will let onions alone after that. That strong smell is a device of Mrs. Onion to protect her store of food and the baby plant inside. She makes the food smell so bad that few of the animals will touch it, and so she keeps it safe until spring, when she changes it into flowers and baby seeds.

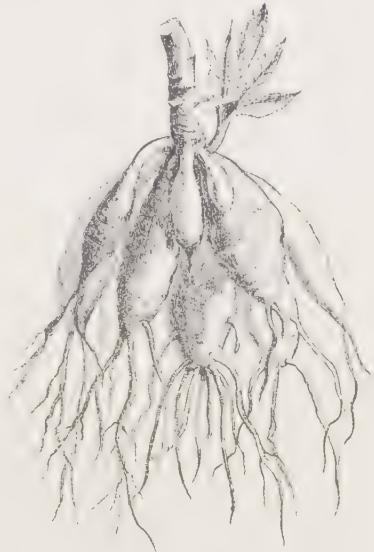
Another plant that is wise enough to lay up food for the next year is the potato. You see the potato hill, as we call it, in the picture (203), and the French artist has drawn it in such a way that you can see the newly forming potatoes in the ground, at the bottom of the plant, as well as



203. THE STORE ROOMS OF THE POTATO.

the blossoms at the top of the stalks. When those blossoms have cradled the baby seeds and packed them away in the round potato balls, the plant will put all its energy into storing up

starch in the potatoes for food next year. Although the potatoes are under ground, they are really a part of the stalk and not of the root, and



204. THE STORE-ROOMS OF THE DAHLIA.

they have buds on them,—the little “eyes” as they are called. During the cold winter weather these eyes will be shut up in sleep, but as soon as the warm sun of spring shines, they will wake up and begin to feed on the white starch in the potato and grow very rapidly. If they are in the cellar away from the light, they will try as hard as they can to reach the light. I found a potato once that had been left on the floor of the cellar farthest from the window, and the new shoots had pushed half-way across the cellar floor in trying to reach the light of the window. And if I had left it, I suppose it would have gone clear across the floor and climbed up to the cellar window and spread its leaves out to the sun and air, and tried to blossom and feed its seeds and start them in life. I have heard of a potato that did this through twenty feet of stalk and even tried to lay up some more food for next year in new potatoes. That was hard work for the poor potato, and its new potatoes were rather small; but it tried as hard as it could to do its duty and keep its family alive by starting the baby seeds and then storing up food for its buds, so that they should find something to eat when they waked up another spring.

Another potato that lays up food is the sweet-potato, but its store-house is not in the stalk, but in the roots where it packs away its yellowish food to start with when it wakes up in the spring after its winter sleep. In the picture of the dahlia’s storehouse (204) you can see how the



food is laid away. You can see more than half a dozen long plump bags of food hanging to the large stalk of last year's plant. Each of those plump bags was only a little slender root last spring, and after Mrs. Dahlia had opened her large, bright blossoms and provided her baby seeds with food, she began to get ready for the next year. And she used all the sunshine



205. THE STOREHOUSE OF THE CACTUS.

she could get to make food, which she packed away in those little roots until they grew as large as you see them in the picture. Then the frost came and pinched all of the leaves, and poor Mrs. Dahlia had to stop her work and go to sleep, something as the potato does. But as soon as spring comes she wakes up again and begins to eat the food she laid away last fall and sends down new roots and sends up new leaves, as you see her doing in the picture, and in

### SUGGESTIONS TO TEACHERS.

**NOTE:** In the last number (31) the quotation from Proverbs should have read *meal* instead of *wheat*.

**Sources of the Illustrations:** The half-tone is "Foes or Friends?" by Phil. R. Morris. The other cuts are from Figuier's "Vegetable World."

**For Preparation:** Besides Taylor's "Morality and Sagacity of Plants," a small book by Hardinge, "With the Wild Flowers," looks at nature from the right point of view. But the best preparation is a study of some of the vegetable storehouses.

**In the Class Room:** Put the pictures in the hands of the children, and get them to tell what they see before the description is read. It might be well to bring in a few bulbs or potatoes just sprouting.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their

a few weeks she will have another family of baby seeds cradled in her gay blossoms.

In the last picture of the cactus' storehouses (205) you can see the wise way the plants lay up food in the hot countries. In those countries they do not have any frost or cold winters, but they have a rainy season and then a long dry spell of weather so hot that it would burn up all of our green leaves. So the plants there have found out how to get along without any thin leaves, and they have made their stalks and tree-trunks into large cisterns of food, just as we often have cisterns to catch the water when it rains and keep it to use later. So they catch the water in the rainy season and store it up for use later.

So you see that plants can plan for hot weather as well as for cold weather, and can build storehouses and make the food, while men and animals cannot make the food, but can only gather it and store it up. And whom do you suppose they get all their wisdom from, so that they can foresee the hot weather and the cold weather, and lay up food to feed on when they awake from their long sleep? You remember that the insects had the same wisdom, and so did the animals and the birds, and men, too. The same Wisdom seems to be thinking in the plant and insect that thinks in our own brain, and that Wisdom seems to be helping all things to be wise, if they are willing to try to learn.

*He giveth wisdom unto the wise.*—Dan. 2, 21.

I laugh at the lore and pride of man,  
At the sophist school and the learned clan;  
For what are they all in their high conceit  
When man in the bush with God may meet?

—Emerson.

multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. Give them no more of body than shows soul, as Browning says of painting.

**Outline of the Course for the year:** It will be seen by the outline given before that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, "Setting the Table" through the third, "Clothing the Family" through the fourth, "Learning to Walk" through the fifth, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

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## Mother Nature's Children.

### IX.

#### BORROWING FROM OTHERS.

##### Part I.—Strength.



##### BORROWING STRENGTH FROM ANIMALS.

You all remember Mrs. Burnett's sweet and touching story of Little Lord Fauntleroy. The little fellow was born here in America and grew up to boyhood with very little money to spend for anything but food and clothes. But when he was seven or eight years old he found out that he was really an English lord, and his grandfather took him home to live in wealth and luxury and gave him everything he could think of to please him. And one of the presents he received was a pretty pony, and the artist who painted this picture calls it "Little Lord Fauntleroy's Birthday Present." I suppose the pretty boy on the right of the picture is the little lord himself, very glad indeed to think that he has got a pony of his own. For, as he told his grandfather, he had often watched the boys of New York ride on their ponies and wished that he had one himself.

And why do you suppose he wanted a pony? Why would you yourself like to have a pony? To ride on it, of course. A pony can go a great deal faster than a boy can run, and when you get on the pony's back you can use his strength to carry you, and a much heavier load than you are, as far as you want to go. For thousands and thousands of years, before men had learned to make engines and railroads, they had to borrow the strength of the beasts to carry them and their loads wherever they wanted to go. The horse is so gentle and strong and swift that I suppose men have borrowed more from him than from any other living creature.

Another animal that men have borrowed much from is the dog. You can see one in the same picture that has the pony. Little Lord Fauntleroy is holding the dog by the hand, and if he wished he could teach the dog to draw him in a



little wagon or a sled. But he would rather have his pony do it because the pony is stronger than the dog. But away up north, where they do not have any ponies, or where the snow is so deep

for food, so that when the cold winter came and there was nothing to eat save the flesh of the wild animals, the father, who wished to feed his children, had to go out in the forest and catch a bear or a deer for food. But the bear and the deer were so swift and strong that it would have been very hard for a man to catch them. And so man trained the dog to help him. Perhaps he took some baby dog from its wild, wolf-like mother and brought it up in the cave along with his own little boys and girls. And when it grew large and strong it wanted to chase the wild animals of the woods and catch and eat them, as its parents had done when they lived their wild lives in the forests. But the man taught the dog to keep what it caught and give it to its master and its mas-

ter's children. So the strength of the dog probably saved men from starving all over the world, in those early days, and helped them to live better, as the strength of the dog helps the Eskimos to live better now.

The reindeer is another animal whose strength the people use who live far north in the cold countries about the pole. In the picture of the Laplander (208), you can see the sort of box-like sled they make to travel in. They put a collar around

that the heavy horses would sink into the snow, they train the dogs to draw sleds with heavy loads on them. You see one of the dog-sledges in the picture (207), with five dogs drawing it. But when they wish to carry a heavier load they use twice as many dogs, and they can carry three or four grown people and go a hundred miles a day, which is twice as fast as a horse could go. And the dogs are so wise, that if they come to a place where the ice is too thin to bear them, they will spread out, so that they may be farther apart and less likely to break the ice. And when they reach the end of their long day's journey, they pass the night sleeping close to their master, who would freeze without them, because the weather is so very cold. It is so cold indeed that sometimes their master has to put boots on the dogs' feet to keep them from freezing as they draw him over the snow and ice.

Long ages ago, before there were any cities on the earth, or any houses, or any herds of cattle or flocks of sheep to give men food and clothing,—in that far-off time when men were only savages living in caves, they borrowed the strength and speed of the dog a great deal more than they do now. Men had not learned to plant corn and wheat in the earth then

the neck of the reindeer and fasten the sled to it by cords; and generally, too, the driver has reins tied to the antlers, or horns, of the deer, though our picture does not seem to show them. With



207. A RUSSIAN BORROWING THE STRENGTH OF DOGS.



208. LAPLANDERS BORROWING THE STRENGTH OF REINDEER.

their team they can go sixty or seventy miles a day, which is faster than our horses can go; and the feet of the deer do not sink into the snow as the horse's would, because they are made so that

without his cows and oxen, as our farmers would with neither oxen nor horses; for without their strength he could do hardly any of the farm-work that he does now.

Another animal whose strength has been used by man is the great elephant which you see in the picture (210). He is lifting a big heavy timber, that would be a load for several men, and he is laying it on the top of the pile which you see at back of the picture. He takes hold of the timber by his trunk, which is a sort of nose and upper lip combined, and it is stronger than the strongest man's arm and yet so delicate that it can pick up a pin from the ground. The keeper is sitting on the elephant's neck telling him what to do, but after he is trained he will do the work without any keeper to direct him. If his keeper shows him

the timbers and where they are to be piled, the animal will go to work and pile them up one by one, just as carefully and as exactly as a crew of men could do it. And this great animal is as gentle as he is wise and strong, and he is as trusty as a dog. He loves his keeper and his keeper's wife and children, so that it is not safe for any one to do them the slightest harm while he is around. The keeper's wife can even leave her little baby with him before the baby can walk.



210. HINDUS BORROWING THE STRENGTH OF THE ELEPHANT.

The elephant is kept chained by the foot when he is not at work, and whenever he sees the baby creeping beyond his reach he winds his trunk about the baby's waist, and takes her up, as gently



209. HINDUS BORROWING THE STRENGTH OF THE OX.

they spread out flat, something as our hand does when we press it on a table. Besides lending their strength to carry their masters about, these reindeer also furnish food by giving milk. For the deer are cousins of the cow. But the deer have never learned to stand still while being milked. When milking time comes the milkmaids have to catch the deer by throwing a noose over her horns; and then they bind the deer fast to a log so that she cannot move until they have finished the milking.

Over in India the cow or the ox is the animal whose strength is borrowed most. In the picture of the Hindus (209), you can see one way they borrow the ox's strength. Instead of the mother using part of her strength for grinding, the ox is harnessed to the mill and has blinds on his eyes to keep his mind on his work, and a bell on his neck to tell when he stops; and by walking round and round in a circle he turns the mill and does all the grinding; while the mother can use all of her time and strength in tending her baby, as you see her doing in the picture. But besides doing all the grinding, the oxen draw people about in carriages, as the dogs and reindeer do up north, though the oxen do not travel quite so swiftly as the dogs and deer. But they have learned to travel much faster than our oxen do, and of course they can draw a much heavier load than the dog or the deer. And their masters take their strength also to plough the ground, as we do, and to gather in the harvest. So that a Hindu would feel lost



as her own mother could do, and sets her down where she will be within his reach. And he will amuse her by taking her up, clasped in his trunk, and setting her on his great shoulder, which she seems to enjoy even more than she does getting on her father's shoulder. Indeed, the elephant seems gentler and kinder and more patient with his keeper's children than their own parents are.

So you see how men have borrowed strength from the animals of the world, from the great elephant and from the little dog, and from many others. We never could have done as much work as we have in ploughing the earth and making long roads, and building great cities, if we had not been able to borrow the strength of animals. But beside borrowing the strength of animals, we borrow the strength of the wind to blow our ships over the ocean and turn the wind-mills. We borrow the strength of the running water to turn our water-wheels and move the machinery of great factories. We borrow the strength of the fire which heats the water in our engines and changes it to steam, so that it can turn our machinery and draw our cars as many miles in an hour as horses could in a day. And then we have learned to change the power of the steam-engine and the water-fall into electricity. So that we borrow the strength of the lightning to draw our cars and do all our work for us. You can hardly think of any power that we do not borrow from somewhere. Surely we ought to be grateful to Someone for lending us all this strength

which we find ready for our use. For this world seems packed full of powers in animals and wind and water and fire, just waiting till we should get wise enough to use them. First we learned how to use the strength of dog and horse, and then we found out how to use the strength of wind and water. But it is only a little while since we became wise enough to train the steam to help us and "harness him down with our iron bands." Yet already we are finding that the strength of the lightning is still better, if we can only learn how to train him to work for us. And I imagine we shall find still greater and better powers as we grow still wiser, for there appears to be no end to the store of strength in the world waiting for us to become wise enough to use it. We seem like children in a Father's work shop with splendid tools all about us that we can use just as fast as we grow large enough to handle them.

*The Lord is the strength of my life; of whom shall I be afraid?—Ps. 27, 1.*

River, and rose, and crag, and bird,  
Frost, and sun, and eldest night  
To me their aid proffered,  
To me their promise plight.—Emerson.

One all-extending, all-preserving Soul  
Connects each being, greatest with the least;  
Made beast in aid of man, and man in aid of beast;  
All served, all serving: nothing stands alone:  
The chain holds on, and where it ends, unknown.

—Pope.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is by A. Stuetz. Nos. 207 and 208 are from "The Polar World," by Hartwig; and Nos. 209 and 210 are from Kipling's interesting book, "Beast and Man in India."

*For Preparation:* The teachers will notice that Lessons 33 to 36 attempt to show how men borrow from animals and plants, and animals and plants from earth and sun. It is a further development of Lessons 25-28, which showed how all creatures helped their own kind. This shows how the different kinds are helpful to each other and dependent on each other, from man down to plants and up to sun and up to the Infinite Source of all life.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. Give them no more of body than shows soul, as Browning says of painting.

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ent topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, "Setting the Table" through the third, "Clothing the Family" through the fourth, "Learning to Walk" through the fifth, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

### MOTHER NATURE'S CHILDREN.

- I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.
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*The happiest man is he who learns from Nature the lesson of worship*—EMERSON.

## Mother Nature's Children.

### IX.

#### BORROWING FROM OTHERS.

##### Part II.—Clothing.

Glad to see you, little bird,  
'Twas your little chirp I heard:  
What did you intend to say?  
"Give me something this cold day?"

That I will, and plenty too;  
All the crumbs I saved for you.  
Don't be frightened: here's a treat.  
I will wait and see you eat.

Shocking tales I hear of you;  
Chirp, and tell me, are they true?  
Robbing all the summer long;  
Don't you think it very wrong?

Thomas says you steal his wheat;  
John complains his plums you eat,  
Choose the ripest for your share,  
Never asking whose they are.

But I will not try to know  
What you did so long ago.  
Here's your breakfast; eat away;  
Come and see me every day.

#### BORROWING CLOTHES OF ANIMALS.

What a gentle little boy that must be in the picture. For you see that not only the hen comes and eats out of his hand but the birds fly down close to him and pick up the crumbs. They have found that the dear little fellow is kind to them, and so they trust him; and as the ground is all covered with snow, the birds cannot find food elsewhere, as they could in the summer, and so they come to him. They have been clothed in feathers, to keep them warm, but they must get food for themselves. You can see a rabbit, too, just behind the hen, looking through the bars of his house; and he, too, is warmly clothed by his covering of fur. And you remember that Mother Nature clothes the sheep and the horse, and the dog and the cat, and the squirrel and the bear, and even the buds and the trees, by leaves, or fur or feathers.

How do you suppose she manages about clothing men and women and children? She lets



them borrow clothes from her other children. That little boy in the picture is clothed so warmly that, though it is winter, he has taken off his jacket to put on the snowy step where he sits, and yet he borrowed all his clothes from the animals and the plants. His hat, his vest, his thick shirt and his coat and trousers and stockings, all came from the animals, if they are all woolen, as I suppose they are. They came from the wool of the sheep, and that wool, as you know, is only the clothing which Mother Nature provides for the sheep. Each autumn and winter the wool grows long and warm on the sheep, so that they are comfortable during the cold winter



weather. But when the warm spring comes again the long wool drops off, leaving the sheep cool and comfortable in the hot summer. And men take this wool to make woolen clothes of. But



212. BORROWING THE CLOTHES OF THE SHEEP

instead of waiting for the wool to fall off, men cut it off with shears, as you see them doing in the picture (212) of the sheep. In that way they get the wool all at once instead of having to pick it up, little by little, from the ground or bushes. Then they take the wool to the mills and have it



213. IN THE BORROWED CLOTHES OF THE BEAR AND THE DEER.

spun into woolen yarn and woven into woolen cloth or knit into stockings, to keep the men and women and children warm in the cold weather.

But men did not always have sheep. Long,

long before they had learned how to keep sheep or to spin yarn or weave cloth, they used to keep themselves warm as you see them doing in the picture (213) of men in the borrowed clothes of the deer and the bear. They took off the skin of the bear or the deer with the fur all on it, and threw it over their shoulders to keep them warm in the winter. And they used it too, as a roof for their houses, standing up poles, as you see in the picture, and spreading the skin of the animals over them with the hair outside. That would keep off the wind and rain and snow, and they could build a fire inside to warm them and let the



214. IN THE BORROWED CLOTHES OF THE SEAL.

smoke go out of the hole in the top of the tent, just as the Indians do still with their wigwams.

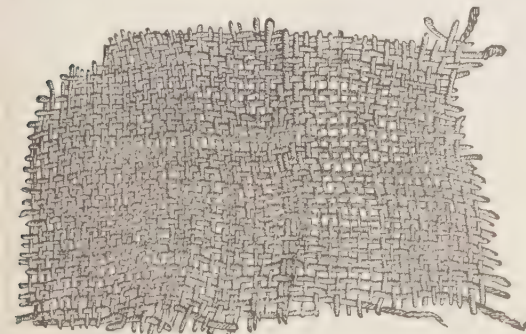
But men found it hard to keep the bear-skins on their shoulders, without sleeves or buttons. So they cut the skins into coats with the stone knives they had, and sewed them up with the needles of bone which they learned to make. In that way they had suits of clothes made of the skins of the animals, like the suits you see the Eskimos wearing in the picture (214) of the clothes borrowed from the seals. For the Eskimos still clothe themselves in skins, and they find the skin of the seal the best and easiest to get. So, instead of having only a seal-skin cloak, as the women do among us, both the men and the women have complete suits of seal-skin,—boots, trousers, jacket and cap. And the suits of the

men and the women are so much alike that you could hardly tell them apart if it were not for the fur bag on the back of the women where they carry the baby, as you see one of them doing in the picture.

### BORROWING THE CLOTHES OF PLANTS.

The people who live in cold countries, as the Eskimos do, may get along by borrowing the clothing of seals, but those who live in hot countries would be altogether too warm with seal-skin suits. Yet they want some clothing to keep off the sun and the rain, so they borrow the clothing which Mother Nature gives the stems and leaves of the plants living in those warm countries. You remember that the bark is the clothing of the tree, and if you should look at the inside of the bark of the elm or the bass-wood you would find a soft, stringy material there. That is the lining of the tree's jacket, and it is such soft, strong fibers as these that men use to make cool clothing, just as they use the fibers of wool to make warm clothing. But they generally use the jacket-lining of the flax instead of the jacket-lining of the bass-wood for their clothes. In the picture (215) of some early cloth, you see the way men used to make their cloth when they were just learning how to weave and spin. For that rough bit of woven string is one of the oldest pieces of cloth in the world. It was found in the bottom of a lake in Switzerland among the pile-dwellings, where people lived long ages ago. It fell into the lake and happened to be preserved, and now we can see from it how they used to weave then.

But we do not know how they wore their clothes in that far off time. They probably just



215. A PIECE OF EARLY CLOTH.

wrapped the cloth about their shoulders, as you see the Sandwich Islanders doing in the next picture (216). These people take the long leaves of the flax and get out the fibers and twist them

into coarse strings, and then stretch the strings out just above the ground, and weave by hand a sort of coarse mat about as large as a sheet. It is very slow work and takes a year and a half for a woman to weave herself one of them. She weaves in a pretty border, as you see in the picture, and then she wraps it about her shoulders, and she is dressed. Her little boy behind her



216. IN THE BORROWED CLOTHES OF THE FLAX.

has a different sort of mat, one that will shed the water and keep him dry when it rains. It is woven like the other one, but it has rows of flax leaves woven in, one above the other, just as if you should have leaves pinned one above the other all over your coat. Of course the rain would run off from the leaves without wetting your coat; and so the rain runs off from the little fellow and he keeps dry,—all but his head. And if it rains very hard I suppose he pulls his rain-coat up over his head and keeps that dry too.

These Sandwich Islanders have not yet learned how to cut out their clothes to fit them and sew them up, any more than the Greeks and Romans had two thousand years ago. But we have begun to learn how to do it, though I suppose we have still a great deal more to learn about it. And we have also learned how to borrow the clothing of other plants besides the flax. The flax gives us all of our linen cloth,



but all of our cotton cloth comes from the cotton plant. The soft fibres that we use for our cloth are really the baby-clothes which the mother plant makes for her baby seed, as you can see in the picture of the cotton baby (217). Mrs. Cotton



217. A COTTON BABY IN HIS BABY-CLOTHES.

wants her baby to have a light and airy dress and so she covers him with a lot of delicate, downy fibers. And men pick off this downy dress as they shear off the fleece of the sheep, and use it for their own clothing.

So you see that all of our clothes are borrowed, —our woolen clothing from the sheep, our linen from the flax, and our cotton from the baby cot-

ton seeds; while our silk is borrowed from the silk-worm, and is really the silk quilt which he spins to wrap himself in when he goes to sleep. Our clothing seems to be borrowed from others just as much as our strength is, and I think we ought to be grateful to Someone for teaching the animals and plants how to spin such fine, soft fibers for us. Perhaps we may sometime learn how to make such things as cotton and wool and linen without the help of the animals and plants, when we learn how they do it. And men are studying them very carefully and finding out more and more about them every year. But we have not learned the secret of making fur and fibers yet, so that we still have to get them to do it for us.

*The lambs are for thy clothing.—Prov. 27, 26.*

And what they call their city way  
Is not their way, but hers,  
And what they say they made to-day,  
They learned of the oak and the fir.

—Emerson, *Nature*.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is "Robin Redbreasts," by E. Munier. No. 212 is from Michelet's "Nature;" No. 213 from Figuier's "Industrie;" No. 214 from Hellwald's "Naturgeschichte der Menschen;" No. 215 from Lubbock's "Pre-historic Times;" and No. 216 from Wood's "Natural History of Man."

*For Preparation:* The teachers will notice that Lessons 33 to 36 attempt to show how men borrow from animals and plants, and animals and plants from earth and sun. It is a further development of Lessons 25-28, which showed how all creatures helped their own kind. This shows how the different kinds are helpful to each other and dependent on each other, from man down to plants and up to sun and up to the Infinite Source of all life.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read.

To make it more real, some natural cotton, wool, and flax-fiber might be brought into the class room.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. Give them no more of body than shows soul, as Browning says of painting.

In teaching these lessons thus to the children they will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can

safely leave the reconciliation of those ideas to the later years of the pupil.

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VI. *Learning to Fly.* 21. Seeds; 22. Insects; 23. Fish to Lemurs; 24. Birds and Bats.

VII. *Helping each other.* 25. The Early Family; 26. The Sister Family; 27. Flocks and Herds; 28. Men and Women.

VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.

IX. *Borrowing from Others.* 33. Strength; 34. Clothing; 35. Food; 36. Sunbeams.

X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.

*The happiest man is he who learns from Nature the lesson of worship — EMERSON.*

## Mother Nature's Children.

### X.

#### BORROWING FROM OTHERS.

##### Part III.—Food.

##### THE MITHERLESS BAIRN.

When all other bairnies are hushed to their hame  
By aunty, or cousin, or frecky grand-dame,  
Who stands last and lonely and nobody carin' ?  
Tis the poor dowie laddie, the mitherless bairn.

The mitherless bairnie creeps to his lone bed ;  
None covers his cold back or haps his bare head ;  
His wee hacket heelies are hard as the iron,  
And lithless the lair of the mitherless bairn.

Oh, speak him not harshly,—he trembles the while  
He bends to your bidding and blesses your smile ;  
In their dark hour of anguish the heartless shall  
learn

That God deals the blow, for the mitherless bairn.

—William Thom.

##### BORROWING THE FOOD OF PLANTS.

Poor little fellow! He hasn't any father or mother of his own to give him food, and so he has to go out in the cold winter weather and ask others for something to eat. And this kind woman has given him a bowl of milk and some of the bread that she had for her own little girl. You can see the little girl clinging to her mother and looking with wonder at a boy that does not have any mother of his own to give him food. And where do you suppose her mother got the bread and milk she is giving the poor little boy?

Of course she got the milk from the milkman and the flour for the bread from the grocer. But the milkman had to get his milk from the cow, and you remember that the cow's food is the grass and grain that grows out of the earth. So that the milk was really borrowed from the plants, while the flour or meal is made of the seeds of wheat or barley or corn. The miller has to get these seeds from the farmer, and the farmer gets them in turn from the plants. So that our bread also is borrowed from the plants.



And the grain out of which we make our flour and bread is really the food which the wise plant mother lays up for its baby seeds. You remember the picture of the baby corn and its food (219), which shows you at the top the little baby corn-plant and the food which Mrs. Corn packs away with her baby in the autumn, that it it may have something to eat as soon as it wakes up in the spring, as you see it doing in the lower part of the picture. That food which the corn-mother lays up for her baby is just as good for



animals and men to eat as it is for the corn. And so men plant their fields with corn, and



219. THE CORN BABY AND ITS FOOD.

when the corn-mothers have stored up hundreds and thousands of kernels full of food for their babies, the farmers borrow the food to feed their cattle or themselves. So that we borrow the baby food of the corn and the wheat and the oats to make our food of, just as we borrow the baby-clothes of the cotton-plant to make our clothing of.

And when our food is meat we borrow it from the plants just the same. For the animals from whom we borrow the meat, borrow their food from the plants, as the cow does, who gives us our beef, and the sheep who gives us our mutton. And all the animals borrow their food from the plants, even those that never eat the plants themselves. The lions and tigers feed wholly on other animals, like the giraffes of Africa. But the giraffes in turn live on the plants. Their tall bodies and long necks enable them to feed on the tender leaves of the trees, as you see them doing in the picture (220). For they are three times as high as a man. They are really the cousins of

the deer and the second cousins of the cows, and I suppose they got their long neck by trying to reach as high as they could. They stretched it little by little, till now they could eat all the leaves and fruit off from an orchard, where a cow could not get any food at all.

In the next picture (221) you see how the monkeys borrow the food of the corn. For this is a corn-field the monkeys have gotten into, and they are having a nice feast on the corn. The home of these monkeys is in Central Africa, and their food used to be such insects and buds and wild fruits as they could pick up in the forests. But since men have begun to plant corn there the monkeys have learned that the easiest way to get food is to borrow it from the corn-field. So when the corn is ripe, a band of these monkeys will make their way along the forest by climbing from branch to branch and tree to tree, till they get close to the corn-field. Then they will come down to the ground and go scampering into the corn-field and begin to pull down the stalks and break off the ears and husk them and eat the corn. And besides what they swallow, they stuff their cheeks full on both sides of their mouths; for they have big pockets in their cheeks, just as squirrels have. And they are as full of fun as the squirrels are, chatting and frolicking all the



220. THE GIRAFFE BORROWING THE FOOD OF THE ACACIA TREE.

time. And you see from the picture that the mothers take their baby monkeys along with

that the bottom was all covered over with strange and beautiful plants, like those you see in the engraving. For the water plants can have very long leaves and very slender stalks because the wind never blows down there. No matter how wild the winds and waves may be on the surface it is always calm at the bottom of the ocean. And the fish go swimming in and out among the water-fields, nibbling at the plants or eating the creatures that live on them, just as the birds do among our orchards and forests.

The insects also have to borrow their food from the plants. If you watch a caterpillar's nest you will see that the growing babies eat a great many of the leaves of the tree, and if you

take the leaves away from them they will soon die. They cannot make food for themselves any more



221. MONKEYS BORROWING THE FOOD OF THE CORN.

them. One Mrs. Monkey has her baby clinging to her breast, and another leads her little one along by having him take hold of her tail, as one of our children takes hold of the mother's dress.

When they have got all the corn that they want to eat they break off more ears to take away with them. And they are very particular about getting the best ears, so that they will often tear open and throw away ten times as much as they take with them. In the front of the picture you can see two ears that they have husked and then thrown away. While they are getting the corn their leader is watching to see that no danger happens to them. For they choose the strongest and oldest of this number to lead them, and they follow him closely. He stands up and looks around while they get the food, and the moment he sees anyone coming he tells them, and the mothers seize their babies in their arms, and the rest grab four or five ears of corn apiece, and then they all rush away to the forest and clamber up the trees again and disappear among the branches, chattering as gaily as if they were so many children out of school.

The fish in the water, too, as well as the animals in the forests, borrow their food from the plants. For plants grow in the water as well as in the air, as you can see from the picture of the fish borrowing food (222). If you have ever floated over the salt water when it was perfectly still and only a few feet deep, you must have seen



222. FISH BORROWING THE FOOD OF SEA-PLANTS.

than you can. If you give a silkworm mulberry leaves enough it will grow from a tiny worm no



bigger than the head of a pin to a large caterpillar three inches long, as you see it in the picture (223). And then it will spin itself a silken cocoon, as you see the lower caterpillar doing.



223. SILKWORMS BORROWING THE FOOD OF THE MULBERRY.

He first spins some loose threads for the outside of this nest, and then bends his head clear back to his tail and turns it round and round, spinning and winding a thread of silk, something as it is wound on a spool of twist. So that he makes of himself a sort of spool wound about with a silk thread a thousand feet long. Then the little fellow goes to sleep in his silk spool, and in a couple of weeks he changes into a moth like that you see in the top of the picture. But he could not do all this without borrowing the food of the mulberry tree.

We see, then, that all living creatures—insects, fish, animals and men—must borrow their food from the plants. Without food we should

all grow weak and soon die. The horse would have no strength to lend us if we did not give him the food of plants. Somehow in borrowing food from plants we borrow strength too. The sheep would not have any wool to give us, nor the silkworm any silk, if they did not both of them first borrow the food of the plant. So that somehow in borrowing food we borrow clothing as well as strength. The plants alone seem to know how to change air and earth and water into a food that shall keep us all alive and strong, from the worm up to the man. The worm knows how to change mulberry leaves to silk, but only the mulberry tree knows how to change earth into the food of the leaf. The horse knows how to change oatmeal into muscle that shall draw your wagon, but only the oats know how to make the food. And though men have studied the plants very carefully, they have not yet discovered this wonderful secret of making food out of the rock and the water and the air. How do you suppose the plants found it out? Someone who was very wise must have taught them how to do it and must have told them to work all the summer long making food and laying it up for all the rest of the creatures that must have it to live and be warm and strong. Surely we ought to be grateful to these busy little plants that wake up at the earliest dawn and labor for us every hour of the whole day. And we ought to be still more grateful to the Wisdom that is working in them.

*He causeth the grass to grow for the cattle, and herb for the service of man: that he may bring forth food out of the earth.—Is. 104, 14.*

When the forest shall mislead me,  
When the night and morning lie,  
When sea and land refuse to feed me,  
'Twill be time enough to die.

—Emerson, *Woodnotes*.

There's not a sparrow or a wren,  
There's not a blade of autumn grain,  
Which the four seasons do not tend  
And tides of life and increase lend.

—Emerson, *Threnody*.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is "My Neighbor," by M. E. Edwards. Nos. 220 and 223 are from Delon, "Recits d'Hist Nat."; No. 221 is from Brehm's "Thierleben"; No. 222 is from Muller's "Kleid der Erde."

*For Preparation:* The teachers will notice that Lessons 33 to 36 attempt to show how men borrow from animals and plants, and animals and plants from earth

and sun. It is a further development of Lessons 25-28, which showed how all creatures helped their own kind. This shows how the different kinds are helpful to each other and dependent on each other, from man down to plants and up to sun and up to the Infinite Source of all life.

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## Mother Nature's Children.

### IX.

#### BORROWING FROM OTHERS.

##### Part IV.—Sunbeams.

If I were a sunbeam,  
I know what I'd do ;  
I would seek white lilies  
Rainy woodlands through ;  
I would steal among them,  
Softest light to shed,  
Until every lily  
Raised its drooping head.

If I were a sunbeam,  
I know where I'd go ;  
Into lowliest hovels,  
Dark with want and woe ;  
Till sad hearts looked upward,  
I would shine and shine ;  
Then they'd think of Heaven,  
Their sweet home and mine.

Art thou not a sunbeam,  
Child whose life is glad  
With an inner radiance  
Sunshine never had ?  
O, as God hath blessed thee,  
Scatter rays divine !  
For there is no sunbeam  
But must die or shine.

—Lucy Larcom.

#### BORROWING FROM THE SUN.

What do you suppose that little girl is doing ? You can tell from the pail and tea-kettle beside her that she has come to that spring to get some water, and leaning against the tree is the shoulder-piece she is going to put on her shoulders to carry the water back. Perhaps her mother is at work getting dinner, and this little girl wanted to help her by bringing the water. But when she got to the spring the water was so still that she could see her face reflected in it, just as you can see yours in a mirror. And so she has stopped to look at herself in this water-mirror. She can see herself now, but if she should come there in the dark night she could not see her face at all in the water, because there would be no sunbeams to help



her. And if there were no sun to give us light we should not have any pictures of fields or houses or anything. So that we borrow all our sight from the sun.

But the sunbeams do a great deal more for us than merely help us to see. In the picture of the sunbeams raising water (225) you see the white caps of the clouds high up in the air over the ocean. Of course you know that the clouds are made of water, but how do you suppose the water climbed up so high as that ? It was the sun that helped it up there. The sunbeams streamed down upon the surface of the ocean



and pulled some of the particles of water apart, so that they became lighter than the rest of the



225. SUNBEAMS RAISING WATER.

water and rose out of it into the air. And they were lighter even than the air down close to the surface of the sea, and so they rose like the balloon till they came where the air was as light as they were. And there they hung as white clouds in the air, and the wind blew them over the land till they struck against some mountain or some colder air, when they changed into drops of water and fell as rain, and ran down the hillside as streams, till they got back into the ocean again. Then the sunbeams would lift them up once more into clouds to rain and run back again as streams. So you see that the reason the streams are always running to turn our wheels and do our work is because the sunbeams are always lifting back to the clouds the water that has run down to the ocean. The strength that we borrow from the waterfall really comes from the sunbeams. The sun's rays lift the water to the mountain top and then let it slide down again in the stream, something as your father might draw you on your sled up a hill to the top and let you slide down again. It would be hard work to pull you and your sled up, but every bit of strength used to draw you up would be at work pushing you down again. Your father would lend you just that much strength to use in going down.

But the greatest thing that we borrow from the sunbeams is our food. Perhaps you think

we borrow our food from the plants, and so we do. But the plants could not make it for us without the help of the sunbeams. Food is made out of the elements that we have in water, air and charcoal, but men have never been able to put the elements together so as to make food out of them. The plants alone know how to change air and water and charcoal or carbon to wheat and corn and potatoes and sugar, but they cannot do it without the help of the sunshine. If you keep the corn or potatoes in the dark they will not be able to make any new food out of these elements, but if you give them sunlight they will at once go to work building up food. We do not know exactly how they do it, but when it is done and the carbon and air and water are packed up in the shape of wheat, we know that the wheat has the power of the sun in it, just as the raindrops have when lifted to the mountain top. The drops use that power to turn our water-wheels, while the wheat uses the power of the sunbeams to move our body and keep it warm. If we want to walk a long distance we can do it, provided we have eaten some food. With a loaf of bread to eat I suppose I could walk fifty miles. If I could, it would be the sunbeams in the wheat-bread that carried me that long journey. The plant somehow used the sunbeams to lift the elements up from carbon and water and air to wheat, as the sun lifts the raindrop to the mountain top, or as your father draws you to the hill-top; and then I took the wheat and went sliding down on it to air and water and carbon again, and I slid fifty miles before I got to the bottom of the hill. And if we should give the wheat to a horse and then use his strength to carry us the fifty miles, we should be sliding on sunbeams just the same. For the strength of the horse would come from the sun.

This wonderful change of sunbeams to food is made in the green leaves of the plant. That is the reason the plant spreads its leaves out to the light. You know if you have plants about a window how they will all turn their leaves towards the light; and if you turn the flower pots around so that the leaves face away from the light, in a very short time the plant will turn the leaves all back again, so that they face towards the window once more. In the picture of the ivy borrowing sunbeams (226) you will notice how every single leaf is so that it can catch the sunlight. Not one leaf is underneath another. The little leaves fill up the little places, and they all have

notches in them so that they can pack themselves closer together. And if you could look at the packed them away in coal. And when we burn the coal we get the sunbeams back as light and

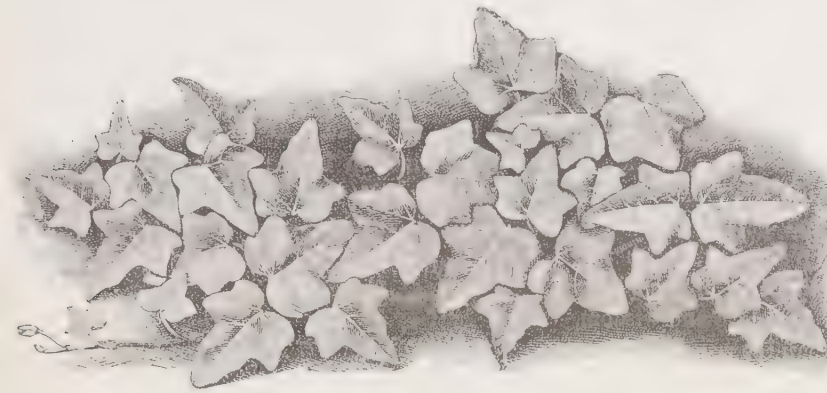
heat; and when we use the heat to change water into steam we get the sunbeams back in the form of the strength which draws our trains and turns the wheels of our mills.

So you see we borrow almost everything from the sun—our food and strength and clothing, and the forces we use to do our work for us. And

stalks of the leaves you would find that some of them were much longer than others. When a leaf could not get sunlight without crowding its sister leaves, it would stretch its stalk farther and farther till it found a good place, and then it would turn its face to the sun and begin to use the light to build up food. And the reason the great trees grow so high in the forest is to lift up their leaves into the sunlight. Plants that live in the forest and do not have strong trunks of their own will climb the trunks of the other trees, as you see in the picture of the plants climbing for sunbeams (227). The vine has reached out its arms and clasped them right around the trunk of the tree, and in that way it can climb up out of the darkness of the forest into the bright sunlight above the tree-tops. And there you will find it spreading out its leaves to make food for its baby seeds. While the trees that do not grow close together in the forest have their lower branches longer than the upper ones to hold the leaves out so far that they may not be in the shade of the upper leaves. If you notice any maple or beech you will see how much wider it is at the bottom than at the top. And if you stand under such a tree in the middle of a bright summer day you will find that hardly a sunbeam is allowed to steal through to the ground beneath. The busy little leaves stretch out this way or that till they have caught every single ray that falls within their reach and used it to make food.

But besides the power in food and running water, we borrow from the sunbeams all the power there is in the steam engine. For the coal, that changes water to steam and makes it strong to do our work, was made by the plants ages ago. They caught the sunbeams and

where do you suppose the Sun gets the power he lends us? Surely he must have to borrow it from some Power still mightier, for every one of the stars in the sky is borrowing as much from that Power as our sun is. And what right have we to be thus borrowing from others all the time? When we borrow money from other men we try to pay it back again, and we would not think it



226. IVY LEAVES BORROWING THE SUNSHINE.



227. A VINE CLIMBING FOR SUNBEAMS.

right to borrow anything if we did not mean to repay it. But how can we pay back the animals, the plants, and the sun for what we borrow?



We cannot pay them by returning what we have borrowed, but we can pay our debts by using what we borrow to make the world better. This seems to be Mother Nature's rule. The plant borrows from rock and water and air and sun, but it repays the debt by making food out of rock and water and air and sun; and a world full of food is a better world than one that has only rock and water and air and sun. And the animals borrow the food from the plants and pay their debts by making a world full of sheep and cows and horses and birds. They change the food of the plants into strength and warmth and love and wisdom, and that is a better world than the world of plants alone.

And so when a man borrows the strength of the horse, the food of the cow, the wool of the sheep, and the help of all the plants, he can only pay his debt by making a better world than the world of rock and air and water, or the world of plants, or of animals even. He must use the clothing and food and strength of the plants and animals to do better things than they could do, just as the doctor eats the wheat, and wears the cotton and the wool, and rides on the horse that he may come to some sick little girl and help her back to health. If he does that he has a right to borrow all these things from others. And so the carpenter who borrows strength and food and clothes

and uses them to build you a house to live in, pays his debt. And so does the teacher who teaches the little ones to live better lives. All of these have a right to borrow, because they are helping to change rock and water and air and sun into love and wisdom; and so they give back more than they take. And perhaps the love and wisdom of human beings are borrowed by some higher Love and Wisdom to make a still better world than we could make of ourselves, so that we are building better than we know, as the animals and plants are.

*God is light.—1 John, 1, 5.*

*The Lord is my light and my salvation.—Ps. 27, 1.*

*Light is sown for the righteous, and gladness for the upright in heart.—Ps. 97, 11.*

He had so shaped his wise affairs  
That he caught Nature in his snares.  
Stream could not so perversely wind  
But corn of Guy's was there to grind.  
And the world's sun seemed to rise  
To drudge all day for Guy the wise.

—Emerson, *Guy*.

From high to higher forces  
The scale of power uprears,  
The heroes on their horses,  
The gods upon their spheres.

—Emerson.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is "Autumn," by V. E. Van Camp. No. 225 is from Buckley's "Fairyland of Science"; and Nos. 226 and 227 from Kerner's "Natural History of Plants."

*For Preparation:* The teachers will notice that Lessons 33 to 36 attempt to show how men borrow from animals and plants, and animals and plants from earth and sun. It is a further development of Lessons 25-28, which showed how all creatures helped their own kind. This shows how the different kinds are helpful to each other and dependent on each other, from man down to plants and up to sun and up to the Infinite Source of all life.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. Give them no more of body than shows soul, as Browning says of painting.

In teaching these lessons thus to the children they will doubtless get ideas of nature that are too narrow

and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

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## Mother Nature's Children.

### X.

#### SLEEPING AND WAKING.

##### Part I.—Daily.



#### PUTTING THE CHILDREN TO BED.

That dog has got tired of waiting for his little master to wake up, and so he has stolen into his room and jumped upon his bed, and he looks as if he would bark to him softly or kiss him to rouse him from his sleep, so that he may get up and dress and have a romp with him before school time. I do not believe that the little boy's mother knows that the dog is trying to wake her son. If she did she would drive him away, for she wants the little fellow to have all the sleep he needs. She has got that nice soft bed for him with its handsome spread, and when evening comes she helps him to undress and put on that pretty nightgown and then tucks him in so that he shall be warm, and I dare say she kisses him good night, and perhaps she looks into his room the last thing before she goes to bed herself to see that he is all right. For she knows that while he is asleep he cannot look out for himself, and he might kick the clothes off and get cold or

roll out of bed and hurt himself. She would be very busy if she had a hundred little ones to put to bed every night, and had to keep them all covered up and safe in bed till morning and then had to wake them and dress them all again. And if she had to put all the creatures in the world to sleep every night—all the birds and all the animals and all the insects,—and watch over them through the night to keep them safe, and wake them at the right time again every morning, I think she would be very much busier than even with a hundred children. I do not know of any woman who would be able to do it, and I do not believe all the women in the world could do it.

Yet Somebody puts all these creatures to bed and to sleep each night and keeps them safe while they are asleep and unconscious, and then wakes them all up again when the morning comes. When the birds have been working and playing and singing all day long and are tired



out at night, they perch themselves on the small swaying branches up high on a tree, to be out of the way of any hungry cats that may come



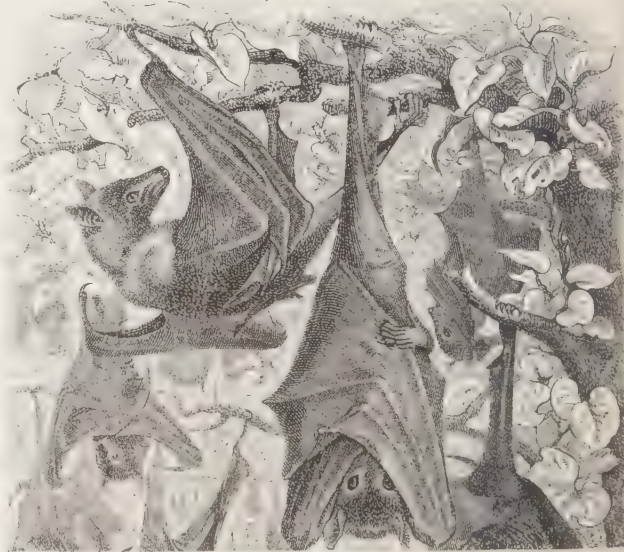
229. PUTTING THE PARROTS TO BED.

prowl around to get something to eat. Then they go to sleep perched on the twigs and stay as safe as the leaves on the trees. How do you suppose they are kept from falling when they are asleep and no longer remember to hold on to the branch? If you will look at your canary bird's feet you will see that the toes clasp the perch something as our hand would,—three of the toes in front and one behind. And the bird's legs are so made that when he sits down close to the branch and doubles up his legs those toes clasp the support without any effort on his part. He really has to make an effort to unclasp them. So that when a bird is asleep he cannot fall from the branch. His feet hold him, just as our feet hold us on the ground when we stand up. We should have to make an effort to get off the ground. We should need to jump in order to do it. And in the same way the bird would have to rise up on the branch in order to get his feet loose from it. All a bird has to do, then, is to clasp his feet about the branch, sink down close to it and tuck his

head under his wing, and he is as safe as if you stood by him and held him on.

But the birds can sleep hanging down from the branch, as well as sitting on it, as you see from the picture of the parrots asleep (229). Their curved claws shut around the branch so fast that they would have to climb up on the branch to unhook them. So they can clasp one leg and curl the other up in their feathers and put their beak in their feathers, too, and then sleep without any danger of falling out of bed. The bats sleep the same way as you see from the next picture (230). Their claws are so sharp and so crooked that the bats have to pull themselves up by the claw on each wing in order to unhook their feet, as you see one of them doing at the upper left-hand corner of the picture. The one in the centre of the picture shows you how they use their large soft wings to wrap themselves up in. They do not have a feather-bed to sleep in, as the birds do, but they have a fine warm quilt, and it has one great advantage over the feathers. It will hold their babies safe. The birds have to build nests for their babies, but Mrs. Bat just folds her wings about the baby and he is just as safe as if he were in a hammock. And there he and his mother sleep all day, for she goes out flying only by night.

But even when animals have no feathers or



230. PUTTING THE BATS TO BED.

wings to wrap themselves in, and when they cannot hang themselves from the branches, they are still put to bed and kept comfortable by

Mother Nature, as you can see from the picture of the fox asleep (231). He has bent himself into a ring, so that his long heavy fur is all on the



231. PUTTING A FOX TO BED.

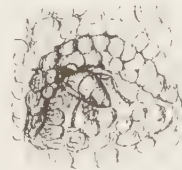
outside and his bare legs are folded up inside where they will keep warm, while his mouth, nose and eyes are nicely provided for by his large bushy tail. Of course he could not have long thick hair over his eyes and mouth, because that would prevent his seeing or eating. So he carries the hair on his tail instead. That is his quilt and his pillow, and he always has it at hand wherever he may be, when he wants to go to sleep.

But the insects are put to bed as well as the animals. In the picture of the ants getting ready for bed (232), you can see how they close the door of their house at nightfall. Their ant-hill is made of little pebbles which they have piled up around their hole, and when it comes night they take the pebbles in their mouths, as you see one of them doing, and carry them to the hole and pile them up one on the other, as men pile up stones when they make a wall. After the hole is all filled excepting one little place at the top, the last ant crawls in through that hole, as you see her doing at the bottom of the picture, and then with her head she pushes sand up against the hole from inside, thus stopping it all up. Then there are no signs of any ants all night long, till about eight o'clock in the morning. At that time if you should watch the closed door carefully you would notice a pair of tiny feelers thrust out through the chinks between the stones; and then an ant pushes out and begins to carry the stones away, and then another ant appears, and another, till the whole family comes pouring out. And what do you suppose they were doing

during the night? If you were small enough to creep down into their little house and spend the night with them, you would see one ant after another taking naps three or four hours long. When one of the tiny creatures gets tired she lies down on the ground, curls her six legs up close to her body and goes to sleep so soundly that you can brush her with a feather without waking her. When she has had her sleep out, she gets up, stretches her limbs and yawns, just as you and I might in the morning, and then she washes herself carefully all over. After that she is ready for her day's work again and sets about tending the babies, or making new rooms, or getting

food for the numerous family.

But the Sleep-giver does not seem to forget even the plants. In the picture of a plant awake and asleep (233) you will see on the left side how the leaf-stalks stretch out from the plant



232. PUTTING THE ANTS TO BED.

and hold the leaves out level to catch the sun's rays for making food; while on the right side, when the plant is in the darkness of night, the



leaves fold up close to the plant. There is nothing for them to catch but cold, and so they cosy up close together to keep warm; and they rest from their work till morning comes, when

So you see that Someone gives sleep to all the creatures on the earth, from the birds and animals down to the insects and plants. Someone knows when they are weary and gives them the rest they need. Someone remembers them, when they are unconscious and unable to care for themselves, and Someone wakes them again made strong and able to work for another day.



233. PUTTING THE LEAVES TO BED.

they stretch out their green faces to the light again, and work all day making food for us. If you should fasten some of the leaves so that they could not cosy up together, and then should put the plant out of doors some cool autumn night you would find in the morning that the leaves you fastened had been frozen to death, like poor little babies, left out in the cold, while the leaves that were free to lie up close to each other and to the mother plant would wake up all right.

As children bid the guests good night,  
And then reluctant turn,  
My flowers raise their pretty lips,  
Then put their night-gowns on.

As children caper when they wake,  
Merry that it is morn,  
My flowers from a hundred cribs  
Will peep and prance again.

—Emily Dickinson.

*He giveth his beloved sleep.*—Ps. 127, 2.

*I laid me down and slept; I awaked; for the Lord sustained me.*—Ps. 3, 5.

His dews drop mutely on the hill,  
His cloud above it saileth still,  
Though on its slope men sow and reap.  
More softly than the dew is shed  
Or cloud is floated overhead,  
"He giveth his beloved sheep."

—Elizabeth Barrett Browning.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is "The Morning Call" by C. Burton Barber. Nos. 229, 230 and 231 from Brehm's "Thierleben," No. 232 is from Dr. McCook's "The Honey Ants and the Occident Ants," by permission of the author. No. 233 is from Darwin's "Power of Movement in Plants."

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## Mother Nature's Children.

### X.

#### SLEEPING AND WAKING.

##### Part II.—Yearly.

##### THE SLEEPING FLOWERS.

"Whose are the little beds," I asked,  
"Which in the valleys lie?"  
Some shook their heads, and others smiled,  
And no one made reply.

"Perhaps they did not hear," I said;  
"I will inquire again.  
Whose are the beds, the tiny beds  
So thick upon the plain?"

" 'Tis daisy in the shortest;  
A little further on,  
Nearest the door, to wake the first,  
Little leontodon.

" 'Tis iris, sir, and aster,  
Anemone and bell,  
Batschia in the blanket red,  
And chubby daffodil."

Meanwhile at many cradles  
Her busy foot she plied,  
Humming the quaintest lullaby  
That ever rocked a child.

"Hush! Epigea wakens!  
The crocus stirs her lids,  
Rhodora's cheek is crimson,—  
She's dreaming of the woods."

Then turning from them, reverent,  
"Their bed-time 'tis," she said;  
"The bumble-bees will wake them  
When April woods are red.

—Emily Dickinson.

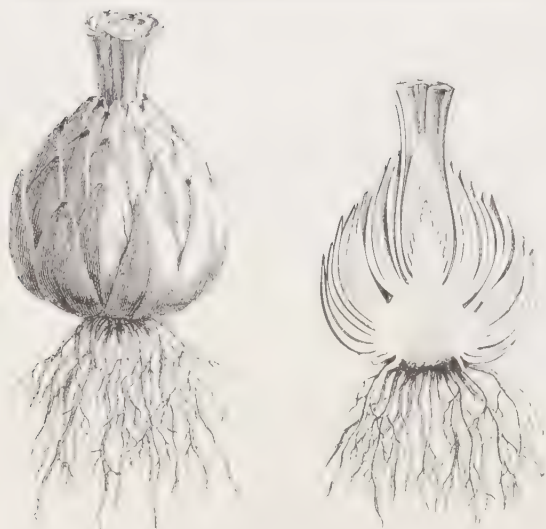


##### A LONG NAP.

What do you suppose that roguish looking girl has in her hand? Of course you will say that it is a snow-ball, and that she is going to throw it at some of her playmates. But I wonder if you know what a snow-ball really is. It is a little piece of the great blanket which Mother Nature spreads over her plant-children when they go to sleep in the fall. You know how she puts all of her great family to bed every night,—from the plants up to men,—and watches over them during the night, and wakes them in

the morning rested and ready for another day of life and love and labor. But some of her children are like new-born babies. They need to sleep more than just at night. If you ever watched a family of little kittens just born, you know that they want to sleep much of the day as well as the night, but when they grow larger and older they can keep awake more of the time. So in Mother Nature's great family the plants seem to need more sleep than the animals. They do not seem so much grown up as the animals are, and when autumn comes the lilies and violets and





235. BABY LILIES IN THEIR NIGHTGOWNS.

grasses and all the plants living in our cold climate go to bed for a nice long nap, lasting all through the cold winter months. You remember how the mother plant wraps up the baby bulbs to keep them as warm as she can, as you see the mother lily doing in the picture (235), which we have had before. But when the mother lily has done all that she can to keep her babies warm, and all the other plant-mothers have wrapt their garments about their own babies, then Mother

Nature spreads over them all a great white blanket of snow, as soft and light and warm as the comforter which your mother spreads over your little bed in winter.

But where do you think this great white blanket comes from? What is the snow made of? If you should look carefully at some freshly fallen snow you would see a lot of tiny, star-like crystals, as they are called, like those represented in the picture of the snow-flakes (236). And if you should hold these tiny crystals in your hand or breathe on them with your warm breath, each one of them would melt into a little drop of water, showing you that snow-flakes are only



237. ANTS AND THEIR COWS IN SUMMER.



236. SNOW-FLAKES MAGNIFIED.

frozen rain-drops. When the cold weather comes the particles of water, instead of clinging together in a round drop, march off in different directions, though still holding fast to each other, something as people form different figures in a dance. Those different figures that the particles of water form are very beautiful, as you see from the the picture. But besides being beautiful they are light and feathery, so that they keep the sleeping plants warm and comfortable. If those of you who live in the north should dig away the snow from your violet bed, or from your lawn, and keep the place bare all winter, you would find the violets and the grass frozen to death in the

spring. But if you keep the flower-bed and the grass covered with snow the sleeping plants will be safe, and when the warm sunshine wakes them again, they will open their mouths and drink in the melting snow and begin to grow at once.

But besides the plants, Mother Nature puts to bed all the insects that live in cold countries and gives them an all-winter nap. You remember the picture of the ants and aphides at dinner (237). If you should mark the spot where the ants lived in the summer and should dig the ant-hill out in the middle of the winter, you would find all the ants sound asleep,—the baby ants, the mothers, the nurses and all the other workers. And in some of the ant-hills you would find the aphides, or ant-cows, also asleep. You know in the story of the Sleeping Beauty how everyone fell asleep,—the princess, the king and queen, the cooks and the stable-boys and even the horses and cows,—and all slept till the bold prince came and kissed the princess; and then they all woke up just as they fell asleep. That was a fairy story, but the ants and their babies and their slaves and their cows all go to sleep and really sleep motionless for months under the ground and under the blanket of snow, till some day the bright sun peeps into their hill and kisses them, and then they all awake and begin to tend the babies and milk the cows again, just as if they

of them out of the water he would draw himself into his shell and shut the round door and seal it fast, so that he would keep moist and comfortable for a long time. A snail was sent from Egypt to the British Museum and stuck fast to a board for



239. MRS. HEDGEHOG AND HER FAMILY.

people to look at in the collection, and he staid there for four long years. At the end of that time somebody happened to take the snail down and washed him in water, when the creature woke up and opened his door and came out. I suppose he thought spring had come again, after his four years' nap; and the people of the Museum were so surprised and pleased to find him alive that they gave him food and put him in a moist place, where he lived a long time.

Mother Nature puts turtles to sleep through the winter just as she does the snails. When the weather grows cold enough for them to begin their long nap, they dig down a foot or so into the ground. Then they pull their head and legs into their shell and go to sleep for the winter. Sometimes they get waked up too early. I knew of one who was sleeping underground in a forest, when he began to feel the earth grow warm about him. It grew so warm that it waked him, and he thought it must surely be spring. So he pushed out his legs and began to dig his way up to the top of the ground to enjoy the newly arrived spring. But when he reached the surface of the earth, he found that the warmth came from a fire some men had kindled in the woods,



238. SNAILS AWAKE.

had slept only a night instead of a whole winter.

But the snails will sleep even longer than a winter, and longer even than a whole year. You see them in the water (238), with their bodies outside of their shells. If you should take one



and instead of its being spring it was still the middle of the winter. So after a little the poor fellow dug his way back again into the ground, pulled himself into his box and went to sleep once more to wait till spring really came, when he and all of his brothers and sisters came scrambling out of their beds.

Some of the higher animals even seem to need this long nap in the winter, and so Mother Nature gives it to them. The hedgehog, that you see tending her babies (239), will make herself a nest under the roots of the trees in the autumn, and line it with leaves. And then she



240. THE JUMPING MOUSE WAKING UP.

will curl herself up into a round ball with the bristles outside, looking like a great chestnut-bur. There she will sleep month after month, all through the winter. And she sleeps much more soundly than she does at night,—so soundly that she seems to be quite dead, just as people do who go into a trance or a fit. But after a while, when spring comes again, Mother Nature remembers her child that is sleeping so soundly, and wakens her, and she comes out of her nest as wide awake as ever.

#### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is "The Challenge," by S. Sidley. No. 236 is from Tyn-dall's "Forms of Water;" Nos. 237 and 239 are from Figuier's works; No. 239 is from Martin's "Naturgeschichte;" and No. 240 is from Miller's "Queer Pets."

*For Preparation:* While lessons 37, 38, 39 will show how life sleeps and wakes daily and yearly and for a lifetime, yet the controlling thought and the topic of the last lesson (No. 40) will be that life is being gradually awakened more and more to feel and understand and help the universe.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read.

In the next picture (240), you will see another of Mother Nature's children who is put to bed for the whole winter. It is the jumping mouse that lives in our fields. When autumn comes he burrows down into the ground a foot or two, so that the frost cannot reach him, and then he curls himself up in a little round ball and goes to sleep so soundly that you would think the little creature dead, if you should dig him out of his bed in the middle of the winter. But if you should take him home and warm him gently, he would stir first one tiny foot and then another, and then he would begin to breathe and would finally open his eyes and sit up and commence washing himself, as you see him doing in the picture; for that mouse was dug out of his bed in the winter and waked up in this way and then put under a glass case, when he began to make his toilet. I suppose he thought the morning had come after his long winter night under ground and he wished to get himself ready for the new day.

So you see how kind Mother Nature is to all of her children. She seems to like to have them wake up and help her all they can, but when they need sleep she gives it to them and tucks them safely away in their beds for a whole winter and spreads her great warm blanket of snow over them all,—plants and insects and reptiles, and all of the animals that are not grown up enough yet to keep awake during the winter. Then when spring comes she wakes them all up again.

*He giveth snow like wool.—Ps. 147, 16.*

When the fierce northwestern blast  
Cools sea and land so far and fast,  
Thou already slumberest deep;  
Woe and want thou canst outsleep.

—Emerson, *The Humble-bee.*

In teaching these lessons thus to the children they will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

*The happiest man is he who learns from Nature the lesson of worship.—EMERSON.*

# Mother Nature's Children.

## X.

### SLEEPING AND WAKING.

#### Part III.—For a Lifetime.

#### LARVAE.

My little maiden of four years old—  
 No myth, but a genuine child is she,  
 With her bronze-brown eyes and her curls of gold—  
 Came, quite in disgust, one day to me  
 Rubbing her shoulder with rosy palm,  
 As the loathsome touch seemed yet to thrill her,  
 She cried, "O mother! I found on my arm  
 A horrible, crawling caterpillar!"  
 And with mischevious smile she scarce could smother,  
 Yet a glance in its daring, half-awed and shy,  
 She added, "While they were about it, mother,  
 I wish they'd just finished the butterfly."  
 They were words to the thought of the soul that turns  
 From the coarser form of a partial growth,  
 Reproaching the infinite patience that yearns  
 With an unknown glory to crown them both  
 Ah, look thou largely, with lenient eyes,  
 On whatso beside thee may creep and cling,  
 For the possible glory that underlies  
 The passing phase of the meanest thing!  
 What if God's great angels, whose waiting love  
 Beholdeth our pitiful life below  
 From the holy height of their heaven above,  
 Couldn't bear with the worm till the wings should grow?

—A. D. T. Whitney.

#### WAKING FOR ONE LIFETIME OR MORE.

Her sweet little baby is fast asleep and now she is going to lay him down in his dainty crib. She looks as if she would much rather hold him in her arms and have him wake up and smile into her face. But she knows he needs a great deal of sleep, and so she lets him sleep nearly all the time. He is just waking up into life and he hasn't got really awake yet. He is only just beginning to know his mother and smile back into her face. But in a little while he will wake up enough to smile at his father too, and stretch out his hands to him. Then in a few months more he will be wide enough awake to get up on his feet and walk about, and in another year he will learn to talk. And pretty soon he will have



waked up enough to go to school and learn to read and write and play ball. Then his mother will begin to feel that she is losing her little baby, but he will be so strong and helpful that she will not be sorry that he has waked up into a young man. Then he will work early and late for his own little boys and girls for many years. But at length he will begin to grow tired and sleepy again in his old age, as he was in his babyhood, and will find it hard work to walk and to remember people and words. And then at last he will go to sleep again in the great Mother's arms as softly and quietly as he slept in his mother's arms when he was a tiny baby. And all over the world the little babies are waking in this way,—



waking first into boys and girls and then into men and women, and after that are growing



242. A KITTEN NOT WAKED UP.

drowsy once more with old age and sinking like tired children into sleep again, just as we all wake each morning to the work and play of a new day and then sink at night into a sweet and restful sleep once more, if we have lived the day as we ought and done the best we could.

All the other animals are being wakened into life in this same way. You see that anxious mother with her baby kitten in her mouth (242). Mrs. Puss had her babies in a tree, because she thought it was safer than a house full of boys and girls. But she saw a terrible thunder-storm coming up one day and she feared her kittens would get wet. So she brought them one by one in her mouth from the tree to the house. She had to do it because the little things were not yet waked up enough to do it for themselves. Only a week or two before, they had waked up so little that they had not even got their eyes open. But in a few weeks they will be wide awake enough to take care of themselves and not need to be carried in their mother's mouth any longer, and in another year they will be so wide awake that they will be caring for babies of their own and catching mice for them. Yet in a few years they, too, will begin to grow tired and drowsy and weak, and at last they will drop into sleep again, as men and women do, and the great Mother will

take them tenderly in her arms and lay them away to rest.

The plants, too, are being wakened into life in this same way, some of them for a very short lifetime and some for a very long one. You remember the picture of the baby pea waking up (243). His mother has packed his little cheeks full of food, and as soon as the first warm day of spring comes he wakes slowly out of his sleep and begins to push his tiny root down into the ground, and in a week you will see him breaking the soil for his first pair of leaves to come out into the sunshine and get the air. Then he will stretch his slender fingers up and clasp the bush you put there for him and climb higher and higher every hour. But in a month he will get as high as he can go, and in another month he will have raised his family of baby seeds, and soon he will begin to look pale and tired, and then he too will sink into Mother Nature's arms to sleep and rest, after his three months' life. But the baby acorn that you see waking up in the other picture (244), will live as long as you or I. Year after



243. A PEA WAKING UP.



244. AN OAK WAKING UP.

year he will go to sleep each fall for an all-winter nap and wake up in the spring for another summer of work. But even he will begin to grow old, and after a hundred years or so, he will sink

into the deeper and longer sleep that Mother Nature gives to her children when they need it.

So you see that the great Mother does not make any of her children live and work forever,



245. CATERPILLARS WAKED UP INTO BUTTERFLIES.

without getting any time to rest and sleep. She lets them all sleep at night, and those that need it she lets sleep in the winter as well as at night; and when they get tired out with life she gives them a still deeper sleep. And she allows some of her children to divide their lives in such a way that they seem to have two lifetimes with a sleep between. When the caterpillar that you see in the picture (245), has finished his life-work as a caterpillar he sinks into a sleep so sound that it seems as if he was no longer alive. But after a few weeks or months the seemingly lifeless chrysalid opens and out comes a beautiful creature with wings who looks no more like a caterpillar than a bird does like a snake. If the butterfly remembers that he was a caterpillar once, and used to creep on the earth, he must think that he has somehow got a second life and one much better than the first. He might wonder who gave him his wings. But you know how the water-baby, out of which the gauzey-winged mayfly comes, gets his wings. He gets them by climbing out of the water and trying as hard as he can to fly, as you see him doing in the picture (246). If he

did not climb out of the water he never would have any wings, and he never would know anything about the bright and beautiful world of air, but would think that there was nothing but water and mud anywhere. And the butterfly must have got his wings in the same way, by trying to fly when he was a caterpillar. Long ages ago the earlier caterpillars must have climbed the bushes and trees and stretched out their lungs into the air and boldly tried to fly. And when they had succeeded in getting wings, so that each new caterpillar found them growing, as we find our power to think and understand growing,—then Mother Nature did a very kind thing for them. When the caterpillar had finished his caterpillar life and was all ready to have his wings come, she lulled him to sleep in her arms for a long nap, and during the sleep his body was made all over for him, so that when he woke he was no longer a creeping worm but a flying insect. He got only what he deserved, but he got it in a pleasanter way than the mayfly does.

And so, I suppose, when we,—her larger children,—have finished our human life and done all we can for her here, she lulls us to sleep in her tender arms, and while we sleep she makes over those of us who have tried to stretch forth the wings of the souls, and gives us bodies better fitted to our growing powers. Therefore, the sleep at the end of life is even more kind and helpful than the sleep at the end of the day, or at the end of the summer. But if we wish to wake



246. A WATER-BABY WAKING UP INTO A MAYFLY.

up with wings next lifetime, we must try all we can to fly this lifetime.

You remember the poor little moth-mother (247), who waked up with stunted wings that



she could not use to fly with, while Mr. Moth, who came from the same sort of a caterpillar, had the beautiful wings which you see in the picture. I suppose the only difference between



247. A MOTH PARTLY WAKED UP.

them was that Mrs. Moth did not try so hard to fly as Mr. Moth did, and so her wings did not grow out so large and strong as his. But our wings do not grow out of our body, so that we

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is "Sleep, Dear Child," by R. Hohenberg. No. 242 is from "Claws and Paws" and is drawn by Harrison Weir. Of the other pictures all but one have been used before and the sources given. They are taken from scientific works recognized as good authorities.

*For Preparation:* While lessons 37, 38, 39 will show how life sleeps and wakes daily and yearly and for a lifetime, yet the controlling thought and the topic of the last lesson (No. 40) will be that life is being gradually awakened more and more to feel and understand and help the universe.

*In the Class Room:* Put the pictures in the hands of the children, and get them to tell what they see before the description is read.

Make the pictures and the descriptions and other matter teach the kind helpfulness of nature as well as her stern refusal to help those who do not help themselves. Do not let the facts of nature obscure the truth you wish to teach, or bewilder the child by their multiplicity. Remember, it is not the formal part of nature, but the spiritual part you wish to teach through the forms. Give them no more of body than shows soul, as Browning says of painting.

In teaching these lessons thus to the children they will doubtless get ideas of nature that are too narrow and positive, but they will outgrow them as they learn more of the world and human life. All conceptions are childish when held by children. Our purpose is to teach only the actual facts about nature. But as every fact is a fairy tale in the mind of the child these facts will "take form and limb" in a way that would make them untrue to us. Yet that is the only way the truth can be held by the child. If we can impress upon the child the love and faithfulness of nature, and also the way in which nature requires effort and desert, we can safely leave the reconciliation of those ideas to the later years of the pupil.

can see them with our eyes or feel them with our hands. They grow out of our mind and soul, and if we try to think clearly and kindly and try to help the whole world in every way that we can, we may lie down to sleep in the great Mother's loving arms without any fear but that she will give us just what we have deserved and treat us as kindly as she treats any of her smaller children.

*When thou liest down thou shalt not be afraid;  
yea, thou shalt lie down and thy sleep shall be  
sweet.—Prov. 3, 24.*

There is no death! What seems so is transition.

—Longfellow.

A dim capacity for wings  
Degrades the dress I wear.

—Emily Dickinson.

Life! we've been long together,  
Through pleasant and through cloudy weather.  
'Tis hard to part when friends are dear,—  
Perhaps 'twill cost a sigh, a tear;  
—Then steal away, give little warning,  
Choose thine own time;  
Say not Good Night,—but in some brighter clime  
Bid me Good Morning.—Barbauld.

*Outline of the Course for the year:* It will be seen by the outline given before that there are ten different topics during the year,—one for each month,—and four lessons for each topic. Thus "Cradling the Baby" runs through the first four lessons, "Tending the Baby" through the second four, "Setting the Table" through the third, "Clothing the Family" through the fourth, "Learning to Walk" through the fifth, and so on. The teachers can thus prepare the work long beforehand, and in many cases the leaflet will be only a suggestion for a much fuller lesson on similar lines. This course is something entirely new, as far as we know, and will inevitably be susceptible of much improvement, and we should be thankful to any teachers, or others interested, for any hints or suggestions of subjects, or pictures or little poems. All such suggestions can be sent to A. W. Gould, 175 Dearborn St., Chicago.

#### MOTHER NATURE'S CHILDREN.

- I. *Cradling the Baby.* 1. Birds; 2. Animals; 3. Insects; 4. Flowers.
- II. *Tending the Baby.* 5. Birds; 6. Animals; 7. Fish; 8. Plants.
- III. *Setting the Table.* 9. Birds; 10. Monkeys to Spiders; 11. Insects; 12. Plants.
- IV. *Clothing the Family.* 13. Birds; 14. Animals; 15. Mollusks; 16. Plants.
- V. *Learning to Walk.* 17. In Water. 18. On Land. 19. On Four Feet. 20. On Two Feet.
- VI. *Learning to Fly.* 21. Seeds; 22. Insects; 23. Fish to Lemurs; 24. Birds and Bats.
- VII. *Helping each other.* 25. The Early Family; 26. The Sister Family; 27. Flocks and Herds; 28. Men and Women.
- VIII. *Laying up Food.* 29. Men; 30. Squirrels; 31. Bees; 32. Plants.
- IX. *Borrowing from Others.* 33. Strength; 34. Clothing; 35. Food; 36. Sunbeams.
- X. *Sleeping and Waking.* 37. Plants; 38. Animals; 39. Insects; 40. Men.

*The happiest man is he who learns from Nature the lesson of worship.*—EMERSON.

## Mother Nature's Children.

### X.

#### SLEEPING AND WAKING.

##### Part IV.—For a World-Lifetime.

Where did you come from, baby dear?  
 Out of the everywhere into the here.  
 Where did you get your eyes so blue?  
 Out of the sky, as I came through.  
 What makes your forehead so smooth and high?  
 A soft hand stroked it as I went by.  
 Where did you get that pearly ear?  
 God spoke, and it came out to hear.  
 Where did you get those arms and hands?  
 Love made itself into hooks and bands.  
 How did they all just come to be you?  
 God thought about me and so I grew.  
 But how did you come to us, you dear?  
 God thought of *you*, and so I am here.

—MacDonald.

#### WAKING THE EARTH.

How proud this mother is of her little boy!  
 What do you suppose it is that makes her  
 so proud of him? I think it is because he is  
 trying to understand that picture. He is such  
 a little fellow that his mother thinks he must  
 be wonderfully bright to study a picture all by  
 himself. She thinks his mind is waking up  
 very early, and she is delighted to see it.  
 And when he gets older she will help his mind  
 to waken more by teaching him his letters, and  
 in that way showing him the pictures that  
 are in words. For you know that words  
 are really pictures of what men have seen  
 and felt. Instead of making a picture of a cow  
 and write the word "cow," and you see the animal  
 in your mind; or instead of making a picture  
 of a mother holding her baby in her arms,  
 as the Chinese do when they want to say "love,"  
 just write the word "love" and you know what  
 it means. So that our words in books are only  
 pictures, and when this little boy has learned  
 some of the picture-words of our Word-Picture  
 book, his mother will send him to school to learn  
 more about the great pictures the earth shows us  
 with its land and water and its states and cities,



and more about the great pictures the sky shows  
 us with its clouds and sunshine by day and its  
 moon and stars by night. If her boy's mind  
 should still keep waking up so that he is interested  
 in all that the schools can tell him about these  
 pictures of the earth and sky, his mother will  
 be still prouder of him and may send him to the  
 university to learn still more. And when he has  
 learned all that the word pictures of the past can  
 tell him about this world, if he still tries to learn  
 more and succeeds in finding out something new  
 that men have never learned before,—then his  
 dear old mother, will be proudest and gladdest of



all, for she loves her boy so much that she wants him to know everything.

In the same way Mother Nature seems to love her children and want them to learn about everything, and she has been waking them up more and more, as that human mother waked her boy up by showing him pictures and sending him to school and college. There was a time, long ago, when Mother Nature had no children awake upon this earth. She had only the great earth, sound asleep,—only the bare rock and empty water, that had not yet waked up into animals and insects or plants even. If your mother hadn't a single child in her house she would be very lonely, I am sure. And I imagine that Mother Nature was very lonely without any children, for she began to try to wake up the sleeping earth into children who could see and hear and understand. She didn't seem able to wake up all of her children so that they should be wide awake at once, any more than the human mother could wake up her boy's mind all at once. She had to wake the children little by little.

First she waked up the water and rock into tiny cells like those you see in the picture of her early babies (249). These cells are much more awake than the water or rock because they can go for their food and stick out their tongues to suck it in and swallow it, and they can help each other a little, too. But they have no eyes to see, or ears to hear, or brain to understand. So Mother Nature did not seem content with them but tried to waken them more. And how do you suppose she did it? By showing them pictures of earth

pictures of earth and sky if you had your eyes shut. But you can feel the difference between light and darkness, even with your eyes shut, and



250. A FISH CLIMBING OUT OF THE WATER.

so could these cells feel it. And a wonderful thing happened to those of them who tried to see as well as feel. Eyes began to grow on their foreheads, and the more they tried to see, the better their eyes became. And as their eyes grew better they saw more things to go after and more things to run away from; and so they grew larger and stronger and swifter as they moved about in the water, till they got fins and bones and were so different from the little cells that they were called fish. You see one of them in the picture of a fish trying to get out of the water (250). He is much more awake than the cells. You can see what large eyes he has, and what a strong tail to paddle himself about in the water, and you notice the fins that he is trying to use for feet.

But even a fish cannot see nearly all of the pictures of earth and sky, because he has to stay in the water almost all the time. So Mother Nature was not content with waking the cell up to the fish. She kept showing to the fish pictures that should wake him up more and make him want to get out of the water, as you see the fish doing in the picture, and should make him want to live on the land and breathe the air. And whenever anyone of her children tries to wake up more she helps him; and in the next picture (251), you can see one of her children that used to live in the water like a fish but has now waked up into a frog. But you can see the baby frog; still swimming about in the water and breathing it, just like fish, with a strong, fin-like tail to paddle them along, and with no legs at all; and down in the right hand corner of the picture you can notice the little round cells which the frogs were before they had waked up into fish. So you

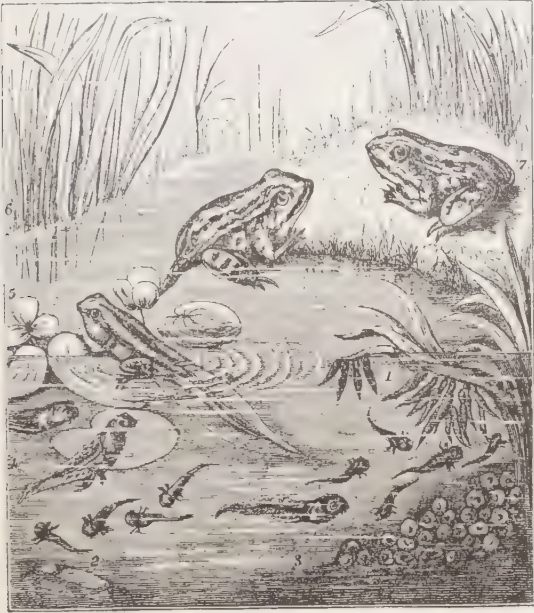


249. ROCK AND WATER WAKING INTO CELLS.

and sky, just as the human mother wakened her boy's mind. Of course these cells could not see the pictures any more than you could see the

see that they wake up from the cell to the fish, and from the fish to the frog.

But even the frog did not satisfy Mother Nature. To be sure, he was more awake than the



251. CELLS WAKING INTO FISH AND FROGS.

cells, and had climbed out of the water and learned to breathe air and had got four legs to stand on; but he had not learned to walk about over the earth, and he was so shy that



252. A DOG SAVING ANOTHER DOG.

whenever she showed him any new picture he would jump right into the water again, like the fish that he used to be. And she seemed to want some child who would go bravely about the world

and see all of its pictures on land as well as in the water. So she kept on waking up the frog, little by little, till she had waked him up into a dog, like those you see in the picture (252). A dog is very wide awake, indeed, and is able to run all over the earth, and even to swim in the water as you see them doing in the engraving, and they have learned to be very kind and helpful to each other. That big dog in the picture sprang into the river to save the little dog. Some cruel boys had thrown the poor little dog into the water to drown him, and were pelting him with stones, when the big dog rushed past them and jumped into the water and swam out to the poor little creature and turned so that he could rest his forepaws on the big dog's back. In that way he swam ashore with him and helped him out upon the



253. A DOG STANDING UP AND RINGING THE BELL.

bank; and when the bad doys came to throw him in again, the big dog showed his teeth and drove them away. In the next picture (253), you see how bright the dog is. That is the door of a convent, and the dog saw beggars come and pull the rope to ring the bell, and then the people inside opened the door and gave the beggars food. So the dog thought he would get some food, and he stood on his hind legs and reached up to the rope and rang the bell, so that the people came to the door.

You see then how bright and kind the dogs are, but Mother Nature did not seem willing to stop waking her children, even when she had reached the dogs. She kept showing them more and more interesting pictures, till some of the four-footed animals, long ages ago, became so



eager to look at the pictures of the world that they climbed up on their hind-legs and used their fore-paws to handle things with, as you see the dog trying to do at the convent door. And these newly aroused creatures that walked on their hind-legs and had hands, began to wonder what all these pictures meant, as the little boy in our first picture is wondering. That delighted Mother Nature as much as the little boy's wonder delighted his mother, and the kind Mother began to try to waken the mind of this new man-child still more by getting him to make word-pictures of what he saw and thought, so that he could write down in books all he learned about the world. She sent him to school to study the great pictures of sky and earth, and when he has waked up enough to try to understand them, I suppose she will send him to some greater school,—some university,—where he can study the Universe much better than here in the schools.

This is the way, then, that the kind Mother has been waking the earth into children, who can love and help each other,—waking water and rock into the cells, and the cells into the fish, and the fish into frogs, then into dogs, and then into men. And the men she has been coaxing to be more

and more wide awake. She has not been putting us to sleep except to rest us. We were sound asleep at first and she wakened us out of the sleep, and she is still waking us just as fast as we are willing to be wakened, just as fast as we are willing to open our eyes and see her new pictures and try to understand them. For we have not yet seen all the pictures in her great Picture Book, though we have seen enough to show us what a kind and loving world this is that we live in.

*Awake, thou that sleepest, and arise from the dead.*

—Eph. 5, 14.

Be sure they sleep not whom God needs.

—Browning.

Go wake the seeds of good

Asleep throughout the world.—Browning.

Once slept the world, an egg of stone,  
And pulse, and sound, and light was none;  
And God said, "Throb!" and there was motion,  
And the vast mass became vast ocean.

But he, the man-child glorious,—  
Where tarries he the while?  
The rainbow shines his harbinger,  
The sunset gleams his smile.—Emerson.

### SUGGESTIONS TO TEACHERS.

*Sources of the Illustrations:* The half-tone is "The Two Readers," by C. von Bodenhausen No. 249 is from the Encyclopædia Britannica, article "Protozoa;" No. 251 is from Buckley's "Winners in Life's Race;" No. 250 is from Jones' "Animal Creation;" and Nos. 252 and 253 are from Menault's "Animal Intelligence."

### NOTICE TO SUBSCRIBERS.

This is the concluding number of the First Series of NATURE STUDIES, but a Second Series will be issued the coming year, beginning Sept. 1, to be called *Mother Nature's Rules*. We hope all who have taken the First Series will continue with us for another year, and we inclose in this number a *subscription blank* for that purpose. We would thank all of the large and growing list of subscribers for the cordial interest they have shown in this attempt to teach religion from the facts of the life all about us. To the many who have asked whether the leaflets could not be had in a bound form, we are glad to announce that such a *bound volume* is now for sale at 85 cents. Some of our readers have been preserving the copies and have reported that occasionally a number was damaged in the mail. If all such subscribers will return the damaged numbers, *with their address*, we will be glad to send fresh copies.

### SECOND SERIES OF NATURE STUDIES.

The First Series of NATURE STUDIES,—called *Mother Nature's Children*,—tried to teach the immanence of God by showing the love and tenderness and wisdom and care that was manifested in nature, from man down to the plant, in such a way that the little child could feel it.

The Second Series of NATURE STUDIES will be called *Mother Nature's Rules*, and will try to teach the undeviating laws of nature that we must all learn and keep. This Second Series, like the First, will have ten topics,

—one for each month,—and each topic will be divided into four lessons, making forty lessons, with a separate leaflet for each Sunday.

The first topic, as will be seen from the outline below, will be *Faithfulness*; and that topic will have four lessons on the exactness and invariability of gravitation, of chemical action, of crystalization, and of the qualities of the elements; pointing out, also, how necessary the same exactness and steady effort is in animal and plant life and in human affairs, thus showing that the virtue of "Faithfulness" has its roots down deep in the heart of the Universe, and that Mother Nature is as faithful to us as she requires us to be to her.

So with the second topic, *Willingness*; and the third, *Gentleness*, and with all the rest. Each lesson will also have a half-tone reproduction of a work of art, bearing on the subject, and several other pictures of the objects described. This Second Series will be a little more advanced than the First Series, called *Mother Nature's Children*. That Series taught the religion of nature, while this will try to teach the morality of nature, the Rules which Mother Nature has for her household. The following ten topics have been suggested:

#### MOTHER NATURE'S RULES.

- I. Be Faithful (exact, industrious).
- II. Be Willing (prompt, open-minded, modest).
- III. Be Gentle (self controlled, patient).
- IV. Be Pure.
- V. Be Beautiful.
- VI. Be Sincere (frank, honest, true).
- VII. Be Sympathetic.
- VIII. Be Brave (fearless, self-reliant).
- IX. Be Grateful.
- X. Be Generous (unselfish).

**Mother Nature's Children.** This Series can be had, bound, for 85 cents.







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